

SOLUS NEWS

Vol. 1, No. 1 SOL Users' Society Jan./Feb. 1978
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SOLUS TO MEET AT SECOND WEST COAST COMPUTER FAIRE

The Computer Faire creatures are at it again. There will be a second one, in San Jose, CA, on March 3-5. SOLUS will have some sort of get-together there. Suggestions for what to do will be greatly appreciated. Anyone in the San Francisco Bay Area who would like to help organize a mini-program should contact SOLUS. For more info on the Faire itself, write to Computer Faire, Box 1579, Palo Alto, CA 94302.

SOFTWARE TECHNOLOGY'S "MUSIC SYSTEM"

by Rod Hallen, Tombstone, Arizona

Having been a frustrated would-be musician for years, one of my goals has been to make music with my SOL. Software Technology's "Music System" seemed to be the answer and the price is right. (\$24.50 PP) Seven days from order to arrival is O.K., too.

The price includes an S-100 music board kit, a forty-page manual, and a CUTER (and Kansas City format) tape of the program. Since the board only holds five components, construction is a three-minute job. Very simple! The tape contains a high level music language that makes programming easy. 4K is needed at 0000H and 8K is recommended for serious work.

Utilizing the system is not hard and the manual is well written. The tape also contains six selections that are already coded so that you can get a feel for the system and hear it before you attempt to code some of your favorite songs.

The audio signals out of the music board are at a very low level and you have to supply an amplifier to raise them up to listening level. If you have a stereo in your computer room, great. I don't, but two alternatives worked nicely.

The quickest way to hear computer music is to run the music system output to the mike jack on your cassette recorder and record. You then play it back to hear it.

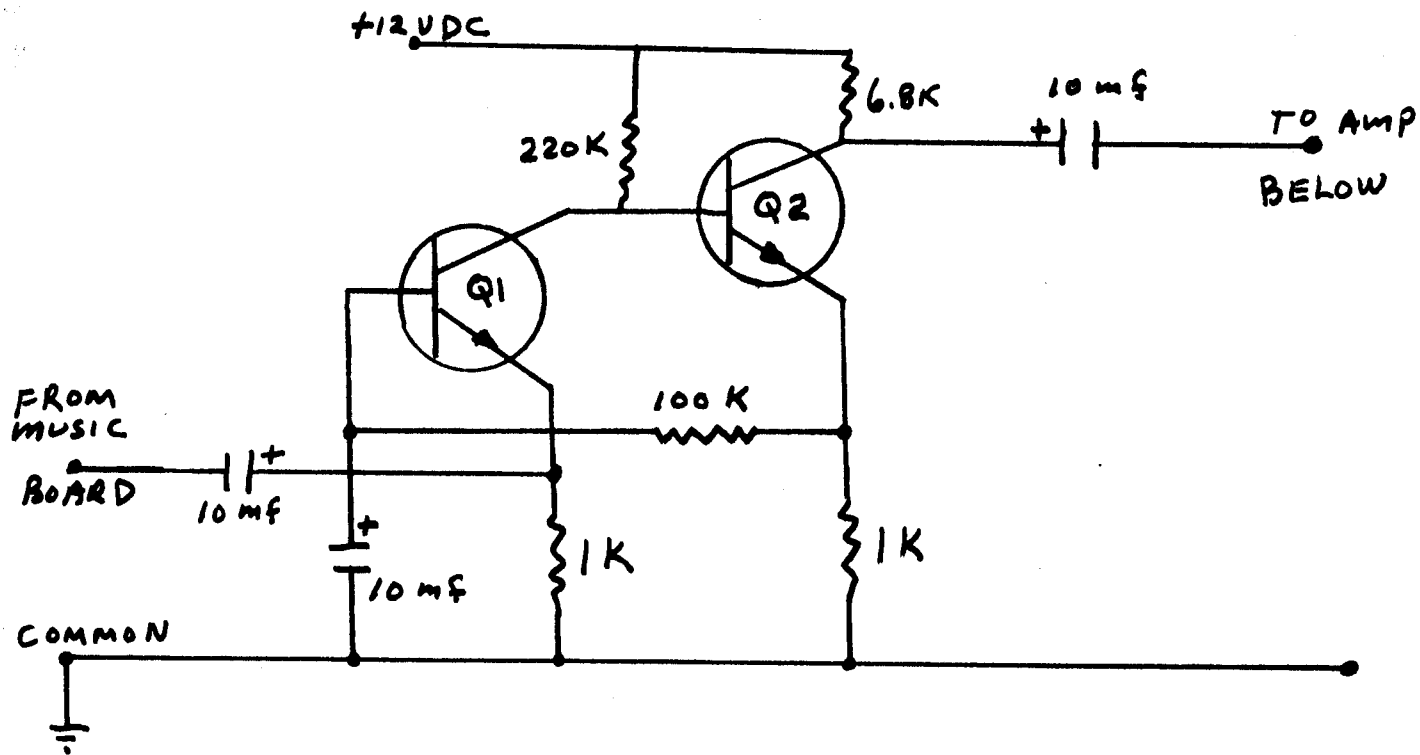
A better choice is shown in Figure 1. This is a very cheap amplifier that runs about two watts and sounds pretty good. I built it on a two inch square piece of perfboard. The components are all available from James Electronics - Total cost is \$2.65 not counting the resistors which can be obtained locally.

Please take note that the ST "Music System" will not compete with a Moog or other synthesizer but it is fun, educational, and best of all, it really impresses friends and neighbors when they ask, "But what does your computer do?"

Notes:

1. Software Technology Corporation
P.O. Box 5260
San Mateo, CA 94402

2. James Electronics
1021 Howard Avenue
San Carlos, CA 94070



C B E
 2N3904
 BOTTOM

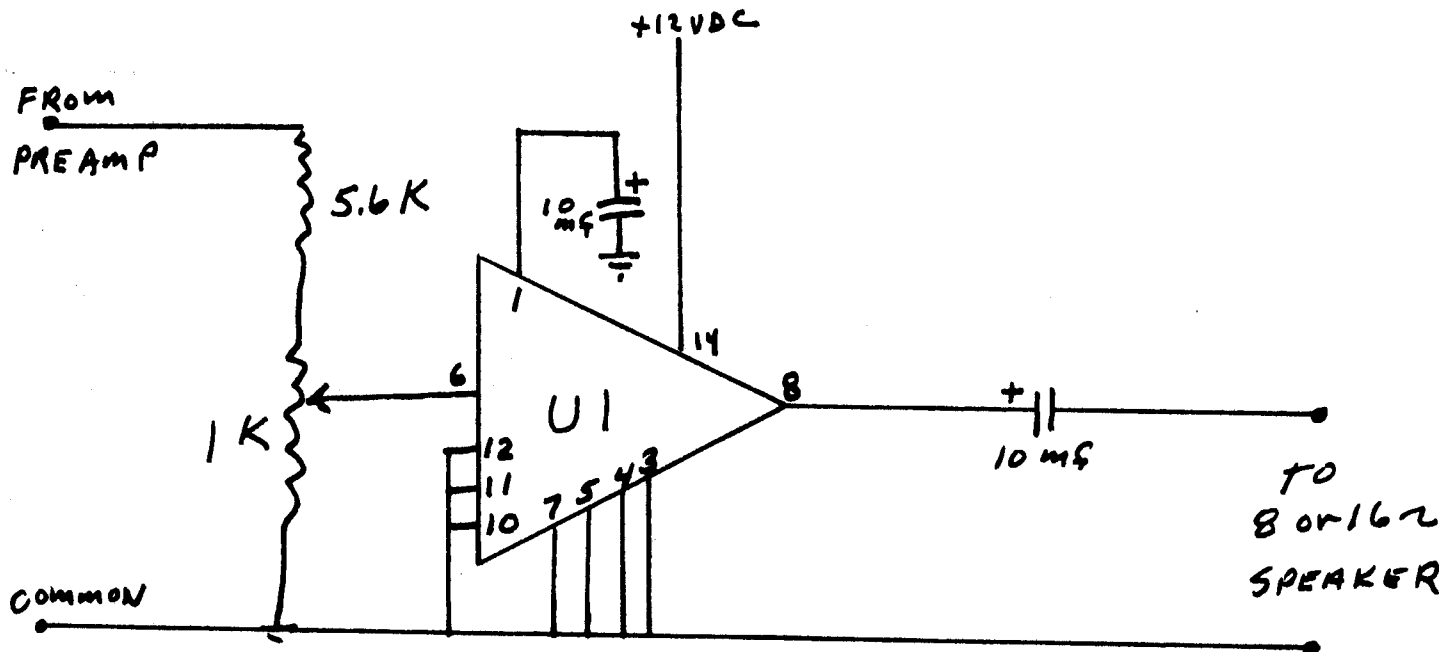


Figure 1

Q-1 and Q-2 are 2N3904 and U-1 is LM380N. Do not use LM380CN which is only .6 watt. All capacitors are 25 volt units and all resistors are 1/4 watt.

Processor Technology's Helios II Disk Memory System

By Ron Parsons

A recent addition (though announced long ago) to Processor Technology's line is a dual, full-size floppy disk memory system. The disk drive used is a PerSci 270 drive which is one of the fastest (and smallest) dual full-size drives on the market. The Helios cabinet is large enough to hold two of these drives (with mounting holes and room to spare). In its usual configuration, the cabinet has one dual drive, a power supply, an indicator panel and a fan. There are a large number of cutouts on the rear panel of the cabinet leading one to believe that it may be used in the future for an expansion backplane or an all-in-one-cabinet computer and disk.

The controller and formatter are on separate S-100 boards. The controller connects to the disk drive with a long ribbon cable and the formatter and controller are connected by a shorter ribbon cable. The formatter can be removed from the bus as it gets only power (+8 V) from it. A separate power connector is provided.

My Helios was built from a kit and required nine hours to complete. About six hours was required for soldering sockets, components and jumpers on the controller, formatter, power supply and indicator panel printed circuit boards. Another three hours was required for mechanical assembly of the disk drive and cabinet. No problems were encountered with the Helios after assembly except for a bad chip on the formatter board.

A disk test program is provided on cassette which has several automatic test procedures. In case the automatic tests indicate any errors, the manual has a long detailed procedure for testing the many functions of the formatter and controller board. The tests are driven by a test program on the cassette. The test procedure requires a triggered, dual-trace scope. These tests enabled me to discover the bad chip quickly.

The controller board runs very hot. I had to cut holes in the back panel of my Sol and add an extra cooling fan (I added two for good measure). The native cooling of the Sol just wouldn't do it.

The Helios uses 32 hole hard sectored diskettes in an unusual format. This format, called "firm" sectoring by Processor Tech, uses a combination of hard and soft sectoring techniques. A file blocksize is not restricted to one sector (in fact, every other sector hole is ignored) but physical blocks can be from one to 4095 bytes in length. By writing long blocks, space for 64 bytes is gained between each "double-sector" of 256 bytes. The diskette capacity is thus increased, long files tend to be more contiguous (fewer seeks required), but at the loss of compatibility with other "standard" hard or soft sector formats. Helios disks are useable only with other Helii.

The software provided, PTDOS, is a very complete and easy-to-use disk operating system. It has two to three times as many commands as CP/M, another well known DOS by Digital Research. This increased flexibility and power does require some additional memory. A minimum useable PTDOS system will require 20-24 K of memory. The system comes with two editors, an assembler, a dynamic debugger, BASIC, FO AL, and, of course, Star Trek.

I've made quite heavy use of the Helios in the past month, mostly with word processing applications. It has proved to be very reliable as a production system and easy to use as a software development system.

HELIOS RISES

by Stan Sokolow

Although it was late, late, late, Processor Tech's Helios floppy disk system finally is real and people are beginning to use them. I haven't had hands-on experience yet, but I've read the manual and seen the unit. Here are some observations.

First, the hardware. The disk drives are housed in an attractive cabinet which has a lot of empty space inside. (It appears that PT plans to put a 10-slot S-100 backplane into the extra space as a bus-expansion option for SOL or as a stand-alone computer with disk.) There are cutouts on the back to mount 4RS-232-type connectors, 4 ribbon cable connectors, and additional fan, and other connectors. Three accessory AC sockets on the back allow turning on the whole system (SOL, Helios, TV, etc.) with one keyswitch on the front Helios panel. The DMA controller board and a formatter board plug into the computer's S-100 bus, but the formatter gets only power from the bus and could be mounted up to 12" away if power were supplied through another connector. Unfortunately in SOL where bus slots are at a premium, there is no convenient place in the SOL box to mount the formatter, so it would have to be mounted outside in an extra box, which is too sloppy for me. So Helios for all practical purposes uses 2 slots in SOL.

Helios uses a unique format for storing data on the disk, and thus it is incompatible with all other floppy disk systems. This at first seemed to be a major drawback, but many hardware-compatible disks are software-incompatible unless they use the same operating system, so incompatibility is common. The benefit from PT's unique format is a greater storage capacity (384K maximum) than the standard (256K) without any higher error rate. In the large-computer world, disks are rarely if ever used to exchange data between computers; standard tapes are the common interchange medium. With the so-called Kansas City tape standard, microcomputers can exchange data on tape just as the big computers do. So I don't regret the unique format.

One deficiency in the Helios hardware is that there is no built-in way to perform an initial program load (bootstrap) from disk. A modified personality module is available to do this, but PT wants \$100 for it. Of course, the bootstrap can be loaded from tape in a SOL or a custom ROM can be used.

The Per Sci disk drives are fast. The worst-case access time (seek + rotational) is 266 ms with an average access time of 116 ms. In contrast, the Shugart 800/801 drives have a worst-case access time of 936 ms and an average of 343 ms.

Now, about the operating system "PTDOS." The only other floppy disk operating system with which I'm familiar is CP/M, the product of Digital Research which is available on many floppy systems including IMSAI, Digital Systems, and Tarbell. CP/M is great, but PTDOS is better. There isn't space here to go into a fully detailed comparison, so I'll concentrate on PTDOS.

The fundamental component of PTDOS is the command interpreter (CI), which is the interface between the user and the operating system. The CI reads from its input device (the Console device) or, at the user's discretion, from any file of commands. A command consists of a file name followed by some blanks followed if necessary by a list of arguments. The file named in the command is loaded into memory at the addresses specified in the file and control is transferred to the file's designated entry point, which is not necessarily within the address space of the file. If more than one file is named in the command, all will be loaded and control turned over to the entry point of the last one. The loaded programs then may read the arguments as though they were in a file, using PTDOS's file manipulating features, and carry out the designated function. The design of the CI allows the user somewhat more flexibility than the command line interpreter of CP/M does.

The system comes stocked with a large number of predefined commands as files on the PTDOS disk. There are commands to copy and format disks, reclaim lost disk space (if a disk disaster occurs), list information about files and about system parameters, copy files, save memory areas as "image files," dump files, save and get files from an archival file, manipulate files (open, close, read, write, etc.) on a command level, set memory to any value desired, and so on.

In many cases the PTDOS commands are more powerful than the comparable CP/M commands. For example, CP/M's memory saving command only allows saving memory in one chunk containing an integral number of memory pages (256 byte blocks aligned on page boundaries). PTDOS's memory saving command allows any number of memory areas, not necessarily contiguous, of any size to be saved in one image file. CP/M doesn't save an entry point address for the file; it only loads memory image files at address 100H and transfers control there. With PTDOS the user can create commands which load into memory areas reserved for them without disturbing other programs in memory.

PTDOS uses this scatter loading feature to provide certain system utility commands ("safe commands") that can be used without disturbing the users memory space. These utilities load into one of two small areas within PTDOS reserved for this purpose. One such command is a general purpose message writer which all of PTDOS uses to give error messages to the user. Thus other PTDOS commands only need to contain code numbers for error messages and not the full message text. When a message is needed, any program can call upon the utility handler to load and execute the message writer and return control to the calling program. Of course PTDOS lets the user's programs call the utility handler if desired, and the user can create his own private utility file as well. CP/M provides nothing like this to my knowledge.

Another major component of PTDOS is the file manager. It provides the user with routines his machine language programs can use to do all of the customary file operations, such as creating, opening, closing, killing (deleting), reading blocks, writing blocks, reading bytes, writing bytes, seeking a byte or block directly (random access), and so on. Each file contains seven attribute flags that can be set to protect the file against certain operations. For example, a file can be protected against reading, writing, killing, attribute changing, etc. Unfortunately, PTDOS doesn't provide passwords to identify authorized file users as some more sophisticated operating systems do, but here again CP/M doesn't provide any file protection feature.

CP/M requires the user to manage his own set of buffers for multiple files. PTDOS has a built-in buffer area and automatic buffer handling with either static or dynamic buffer allocation. Files obtain buffers when needed and return buffers to the pool when they're no longer needed. Users need not concern themselves with buffers or file control blocks (FCB's), since PTDOS handles them internally. The FCB and buffer area is adequate for 8 files simultaneously open, and this can be expanded to any size desired if RAM is available.

Just about everything in PTDOS is handled as a file. I've mentioned that the command argument list is read as a file. In addition, all input/output devices are handled as files. These "device files" are read from, or written to, just like any file on the disk. Thus, for example, the file copy program can be used to "copy" data from the console keyboard device to a disk file. Any user program which is set up to read from a file and write to a file can be used without change to read from any device and write to any device by defining the proper "device files." In reality device files are the device handler routines that communicate with programs thru the standard interface created within PTDOS. This versatility allows programs to use new devices as they become available without reworking the programs. (It also provides the basis for an implementation of the Unix operating system's "pipeline" concept within PTDOS.) CP/M only makes a primitive attempt at achieving this device independence thru the use of Intel's "IOBYTE" feature. PTDOS is far more general and elegant than CP/M in this regard.

Although PTDOS as distributed is a single-user operating system, it has explicit provisions for real-time interrupt handling and multi-user capabilities. In addition, the Helios controller hardware can be modified (although the manual doesn't explain how) to provide signals on "seek completed" and "transfer completed." These signals can be used to free the processor to do useful computing during disk transfers. PTDOS provides the facilities to operate in this interrupt-driven environment. It is possible that PT has long range plans for a multi-user system and the basics are already built into PTDOS. The extra cutouts on the back of the Helios enclosure also suggest that Helios is to become a multi-user system. CP/M is a single-user system too, although interrupts can be accommodated in CP/M. It may not be difficult to adapt CP/M to a multi-user system, if the hardware provided the DMA and interrupt capability that Helios does. In this regard CP/M and PTDOS seem similar.

In addition to the operating system, the PTDOS disk includes two editors, a disk-based assembler, a debugger, a disk formatter and copier, a powerful macro-processor for generating complex command sequences with parameter substitution, a disk version of BASIC/5, a disk version of the FOCAL interpreter, and TREK-80 (a real-time Star Trek game).

The operating system resides in the 12K area of memory from 9000H to BFFFH. This includes the buffer pool area, the resident system code, a global data area, the safe command areas, and an entry point table. The bottom of memory is available to the user.

In summary, PTDOS is a very extensive, well-planned operating system with great potential. Helios with PTDOS is a powerful tool. I'm happy I waited for it.

Actually, there's a lesson to be learned from my experience with another disk system I tried to buy. After P.T. announced Helios more than a year ago, I began shopping for comparable disk systems. I wanted the largest capacity I could get. The Digital Systems dual floppy seemed to be the best I could find--even better than Helios I thought. It was a well-tested product that had been in use on IMSAI's and ALTAIR's for a few years. Owners of it had high praise for it and its manufacturer. And although it was of the standard IBM format, a double density version was on the drawing board and I could have it upgraded to double density when the new controller became available. It came with QP/M. So I bought it.

The single density version worked okay, but when I had it upgraded to dual density: chaos. John Torode of Digital Systems is a super-nice person and spent many hours investigating my system but couldn't get it to perform reliably. He felt that the DMA (direct-memory-access) was too demanding of the SOL's bus at the data rate needed by double density. The noise on the bus was too much for his controller to cope with, although it worked well in his IMSAI. He and P.T. had several discussions and each felt the problem was in the other's design. I was caught in the middle. John, being the honorable businessman he is, took the system back and gave me a refund. He may have solved the problem by now; I don't know.

I was sorry to have lost the beauty of having the dual density capability, but glad to have gotten out of the mess. I hate to think what would have happened if the problems were subtle and didn't become apparent until much later. I had learned what people mean when they say S-100 is not really a standard. Things aren't as compatible as they seem. When it comes to complex components, such as dynamic memories and DMA devices, it is foolish to get too many manufacturers products into one system. You are too vulnerable to being caught among lots of finger-pointing.

In conclusion, Helios has a lot to recommend it for SOL owners looking for a high performance disk system.

LETTERS

The Oct./Nov. issue was excellent. I have a SOL-20 with North Star disc. I gave up on Helios. It has been over one year since PT advertised the availability of 8K BASIC. I have not seen it yet. PT gave up to the competition the head start it had. By now PT should have had a TDL-like line of software. I suspect that many SOL users have gone the North Star route. I would be interested in software to run on the SOL-North Star combination and more information on Selectric printers.

--Robert Carnighan (Prospect, Kentucky)

(Editor: I suspect that you're right about many SOL owners buying North Star disks. It's ironic that, as I understand it, the North Star people may be responsible for the great delay in PT 8K BASIC. I have no personal knowledge of the story, but from remarks gleaned from high ranking employees of PT and North Star, I think the story goes like this. In its early days, PT shared office space with the people who later formed North Star. PT contracted with them to produce a BASIC for SOL which was to start as a small 4K BASIC and be upgraded to 8K and then 12K. This BASIC is the BASIC/5 we have now. But a dispute developed over the ownership of the BASIC, and the contract for upgrading it, after North Star laid its plans to produce the North Star disk, which would also need a good BASIC. The dispute has been in the courts

and needless to say, PT and North Star are not on good terms. Meanwhile, PT has developed its own BASIC which should be released soon. Rumors say it takes 12K to 16K or so, and has lots of nice features. SOLUS Library will contain North Star - SOL programs, many from the North Star users library. Our library soon should be ready to service requests for software. We'll announce the procedure in SOLUS NEWS.)

* * *

Stan,

The damndest thing happened--sent you check for \$4.00 to join you organization. Even volunteered to set up a local chapter. Since then no word--no more newsletters --Sept. was last one. What happened???

--James F. Ruckstuhl (Barstow, Calif.)

Dear Jim,

A lot of people asked themselves the same thing. I became bogged down in making a living and couldn't get the newsletter out monthly, so I went to bimonthly and was late at that! If all goes well this issue should get me caught up.

--Stan

* * *

Has anyone successfully used an Expando Model 123P printer on SOL's parallel interface? Mine types a listing okay, but when I type in a letter it continuously types the letter until I type in the next letter. This continues until I type in the slash; then it will print all the programs I typed into the SOL-20. I noticed the READY pin #16 goes high when a letter is typed in momentarily, but when it goes high permanently it types the last letter repeatedly--I can't understand why it does not stop.

--Fred Saluna (Martinez, CA)

DOCUMENTATION NOTES

Ron Parsons has reported that the 11-8-76 version of the SOL keyboard schematic contains an error: the gate in U27 containing pins 10 and 11 should be labeled so the output is pin 8 and the upper input is pin 9. Make note of it in your manual.

Anyone finding errors in Processor Technology documentation, or any other documentation relevant to Processor Technology equipment or software, is requested to send a copy of their report to SOLUS for publication in this section.

BOOK REVIEW

Practical Microcomputer Programming: the Intel 8080, by W. J. Weller, A. V. Shatzel, and H. Y. Nice, Northern Technology Books, 1976, \$23.95.

(This is a book review by indirect addressing. I've received inquiries from novices who want to know a good book for learning assembly language programming. I've glanced at this book and received very positive comments from others who've read it. By chance, BYTE magazine has a review of it in the January 1978 issue. The reviewers gave it a very good review, with the caution that it is intended for the beginner who already understands computer programming in some higher level language such as BASIC.)

LOCAL CHAPTERS

The purpose of local SOLUS chapters is to let members get together with others in their area for exchange of software, ideas, etc. The structure and activities of a chapter is entirely up to its members. SOLUS will publish the chapter's contact address and meeting schedule. Each chapter can have news and articles published as a mini-newsletter within SOLUS NEWS by submitting camera-ready typing to the editor. We hope chapters will provide us with some help in operating SOLUS and give us feedback.

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NEW CHAPTER:	
Redding, CA:	Darrel Rawlings, 3075 Churn Creek Rd., Redding, CA 96001

CHAPTER NEWS

Dear Stan,

Hello! Merry Xmas, Happy New Year, etc. I am at last writing to you in answer to your inquiry from late Sept. about a possible SOLUS group in Ottawa. If a local chapter has not yet been set up, then I would indeed not mind coordinating some sort of activity among the SOL system operators in Ottawa. Or, should a chapter already be operating in this area, would you forward my name to them. At present, I am aware of only one other SOL-20 in Ottawa, although the local dealer says several have been sold. The Ottawa Computer Group of which I am a member, is very hardware oriented and although the group's membership is near 200, most members are in mid-construction of almost every other kind of equipment except Processor Tech. stuff. I am quite anxious to discuss programs, etc. in person with other people who have the configurations I now understand. I look forward to hearing from you.

Best wishes,

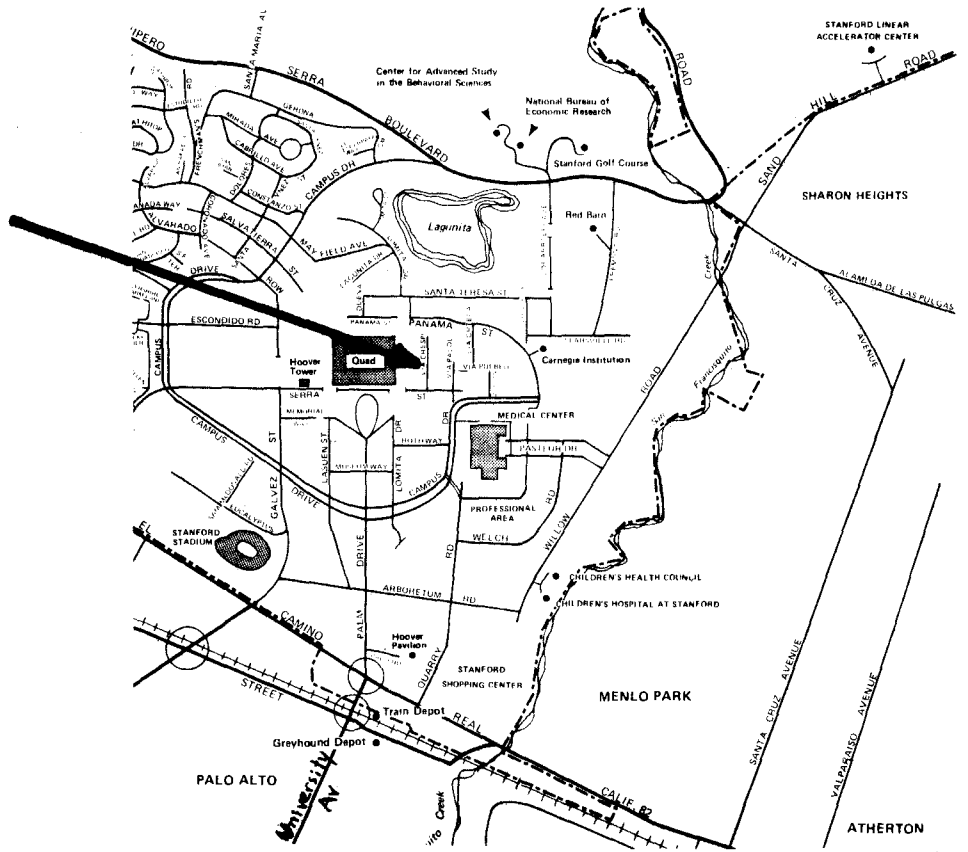
Barrie Ridsdale
Ottawa, Ontario

INSTRUCTIONS FOR AUTHORS

SOLUS NEWS is produced by a very small staff and we'd like to keep our dues down. So we ask, whenever possible, send your letters and articles in camera-ready form. That means typed with a dark ribbon and clean type on plain white paper, one side only, single spaced. Use 3/4" margins all around. Corrections can be made invisibly using "Liquid Paper" correction fluid. Avoid the so-called "erasable" bond papers because they smear easily. Computer listings are fine if the ribbon is dark.

But please don't hesitate to send something because you can't get it into camera-ready form. We'll retype it if necessary.

San Francisco Peninsula chapter of SOLUS meets at the Stanford Physics building located here.



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IMPORTANT NOTICES

Due to a misunderstanding, Kilobaud magazine published that our newsletter is available for \$4, but our 1978 dues actually are \$10 (\$15 outside of USA, Canada, or Mexico). If you sent us \$4 in 1978 we've placed you on our mailing list, but we must request the balance of the dues to cover our expenses. Please send your payment to our P.O. Box shown above.

If you joined us in 1977 and haven't yet paid the 1978 dues, please take a moment now to send it. We realize that \$4 for the few 1977 issues of SOLUS NEWS seems overpriced. We plan to pay back our 1977 members with some sort of bonus for their early support.

SOLUS BOOTH AT COMPUTER FAIRE

Processor Technology has donated the use of a commercial booth at the 2nd West Coast Computer Faire. SOLUS plans to have exhibits, hand-outs, and someone to answer questions at the booth for as many hours each day as possible. If you plan to come to the Faire and wouldn't mind helping to staff the booth for a one-hour slot, please let us know. Also if you have an interesting application you'd like to exhibit, contact us right away so we can make arrangements for you to get your equipment thru the security people. Let us know when you want to present your exhibit. We're especially interested in showing home-brewed versions of SOL built from the PC board, and SOL-compatible configurations of other computers.

The Computer Faire will be Friday, March 3 thru Sunday, March 5, at the San Jose Convention Center. To take part in the SOLUS booth write to SOLUS Faire Booth, Box 23471, San Jose, CA. 95153.

BACK ISSUES

If you would like the four back-issues of volume 0, send \$2.00 (U.S.) and a self-addressed envelope to our post office box. Be sure to say this is for volume 0 back-issues. Members who joined in 1977 are entitled to the issues they are missing without charge. New members should receive back issues of the current volume (vol. 1) automatically. Please let us know if you were left out.

EXTENSYS AT MARCH S.F. MEETING

Extensys Corporation, makers of the 64K Dynamic RAM board, will present a program on their entire product line at the March 19 meeting of the San Francisco Peninsula chapter. Ed Hartnett, marketing Vice President, will discuss the background of Extensys, their current products, and glimpses of future products. The RM64 memory board and the FOS1000 floppy disk system will be demonstrated in a SOL. If you're thinking about buying any dynamic RAM or floppy disk, it would be a good idea to attend. Ed has some interesting comments on hardware compatibility problems in SOL's. Bring a friend. Everyone is welcome. The meeting will be 1pm, Sunday afternoon, March 19, at the Stanford physics building as usual.

NEW CHAPTERS

Oakland, CA. Richard Deal, 6957 Saroni, Oakland, CA. 94611.

Montgomery, AL. Harold Drake, 759 Mulzer Blvd., Maxwell AFB, AL 36113

Address change:

Colorado Springs, CO. Larry Leranath, 32 Frost Lane, Colorado Springs, Colo. 80916

LIBRARY? HELP!

If you've written to SOLUS for software or music from our library, you've probably not received an answer. The two members we were counting on to operate these services haven't had the time to make the library distribution happen yet. We have a new volunteer who has offered to take charge, but he needs some help. What we want to do is collect the software onto one or more tapes and have these reproduced with documentation by mass reproduction. We need someone to help organize it, edit the documentation, get it to the typist and the audio reproduction company, and arrange for the mailings. We have professionals we can hire to do the hard parts, but we need people to act as catalysts. (Catalyst = "a substance which accelerates the production of the products, but which may be recovered practically unchanged at the end of the reaction.")

The software library is like a snowball. To get software we need to show some initial activity that can be added to as the ball gets rolling. We have a public domain assembler, disassembler, and simulator. These tools will help more people create programs for the library. We also have programs written in various dialects of BASIC which are being made compatible with PT's BASIC/5 and their new extended BASIC that hasn't been released yet. We also have a number of musical selections for the Music System. If you'd like to receive the whole library for just a few dollars, we need to work together on it.

If you can devote some time to this project, please write to me personally: Stan Sokolow, 1690 Woodside Road, #219, Redwood City, CA 94061.

It would be easiest for someone in the S.F. Bay Area, but some of the tasks can be sent out by mail, so volunteers from any area will be helpful. Thanks in advance.

----- SOL TERMINAL DRIVER -----
 (USING THE SOL PARALLEL PORTS)

BY
 I. HARTLEY WURKZ
 JAN. 17, 1978

THIS IS A CUSTOM DRIVER WHICH ALLOWS THE SOL TERMINAL COMPUTER TO ACT AS A TERMINAL USING THE PARALLEL PORT IN A HANDSHAKING MODE.

THE PROGRAM ACCEPTS DATA FROM THE CURRENT INPUT PSEUDO PORT AND PASSES IT TO THE PARALLEL OUTPUT PORT. IT ACCEPTS DATA FROM THE PARALLEL INPUT PORT AND PASSES IT TO THE CURRENT OUTPUT PSEUDO PORT IN THE OTHER DIRECTION. THIS ALLOWS THE SOL TO PASS DATA FROM ANOTHER COMPUTER TO AN OUTPUT DEVICE AT ANY SPEED UP TO THE MAXIMUM DATA TRANSFER RATE OF THE PARALLEL PORT. (APPROXIMATELY 12 KBYTES PER SECOND).

THE PARALLEL INPUT PORT DRIVER IN SOLOS COULD BE USED HOWEVER THE PARALLEL OUTPUT ROUTINE IN SOLOS CANNOT BE USED AS CODED SINCE THE SOL 8080 LOOPS IN THE PARALLEL OUTPUT ROUTINE UNTIL EX DEVICE IS READY BUT IF THE EXTERNAL DEVICE IS ANOTHER COMPUTER LOOPING UNTIL SOL IS READY, THE HANDSHAKING FAILS.

BOTH INPUT AND OUTPUT PORT ROUTINES ARE GIVEN HERE.

THE DRIVER ALSO CHECKS FOR CONSECUTIVE CARRIAGE RETURNS WHICH CAUSE THE CURRENT LINE TO BE ERASED SO THAT COMMANDS WHICH WERE TYPED ON THE LINE CAN NOT BE CHECKED. THIS ROUTINE DOES THIS BY TESTING THE CARR RETURN READ FROM THE PARALLEL PORT TO SEE IF THE PREVIOUS CHARACTER WAS A CARRIAGE RETURN. IF NOT, THE CR IS SENT TO SOUT, BUT IF THE PREVIOUS CHARACTER WAS A CR, IT DOES NOT PRINT THE SECOND ONE. THIS HAS SOME ADVANTAGES OVER THE DRIVER WRITTEN BY MELVIN SCHEHLEIN WHICH APPEARED IN THE NOVEMBER ISSUE OF ACCESS (P. 20,21) IN THAT HIS DRIVER ALSO SKIPS CARRIAGE RETURNS IF THE CURRENT LINE IS LONGER THAN 64 CHARACTERS (65) AND WRAPS AROUND TO THE NEXT LINE. IF GOING TO ANOTHER PRINTER SUCH AS THE SELECTRIC, WHICH HAS A WIDER LINE, TWO LINES ARE PRINTED ON THE SAME LINE. THIS TECHNIQUE DOES NOT HAVE THAT PROPERTY.

IN ADDITION, THIS DRIVER SUPPORTS THE VDM BACKSPACE FEATURE WHEN USED AS A TERMINAL WITH PROGRAMS WHICH ECHO THE DELETED CHARACTER. WHEN A 'DELETE' CHARACTER IS TRANSMITTED, THE ROUTINE NOTES THIS FACT AND SUBSTITUTES A BACKSPACE FOR THE NEXT CHARACTER RECEIVED FROM THE PARALLEL PORT CAUSING THE CURSOR TO BACKSPACE. THIS IS MUCH MORE PLEASING THAN ECHOING THE CHARACTER.

```

;          PORT EQUATES
00FA =    STAPT: EQU 0FAH          ;STATUS PORT
00FD =    PDATA: EQU 0FDH         ;PAR DATA PORT
0004 =    PXDR:  EQU 4             ;EXT DATA READY BIT
0002 =    PDR:   EQU 2            ;PAR DATA READY BIT
;          SYSTEM EQUATES
C806 =    IPORT: EQU 0C806H       ;INPUT PORT BUFFER
C807 =    OPORT: EQU 0C807H       ;OUTPUT PORT BUFFER
12CB =    ERRIT: EQU 0C2CBH       ;INPUT PORT ERROR
C2D2 =    ERROT: EQU 0C2D2H       ;OUTPUT PORT ERROR
C004 =    SYS8:  EQU 0C004H       ;SYSTEM REENTRY POINT
C310 =    PSCAN: EQU 0C310H       ;PARAMETER SCAN ROUTINE
C33A =    SCONV: EQU 0C33AH       ;PARAMETER SCAN ROUTINE

```

```

C01F = SINP: EQU 0C01FH ;INPUT
C019 = SOUT: EQU 0C019H ;OUTPUT
C1C0 = COMN1: EQU 0C1C0H ;
C054 = VDMOT: EQU 0C054H ;VDM DRIVER
C22E = FDcou: EQU 0C22EH ;CUSTOM COMMAND SEARCH
C80C = ESCFL: EQU 0C80CH
; *****
; CONSTANTS
0080 = MODE: EQU 80H ;MODE
001B = LSC: EQU 1BH
000D = CRRET: EQU 0DH
000A = LF: EQU 0AH
;
;
C900 ORG 0C900H ;START OF DRIVER
;
; *****
; THIS ROUTINE IS THE PARALLEL PORT TERMINAL ROUTINE
; DATA INPUT IS FROM FIRST PSEUDO PORT FIELD
; DATA RECEIVE IS FROM SECOND PSEUDO PORT FIELD
; EXIT IS BY ALT MODE
C900 CD10C3 PTERM: CALL PSCAN ;FIND FIRST PARAMETER
C903 3206C8 STA IPORT ;INPUT PSEUDO PORT STORE
C906 CD10C3 CALL PSCAN
C909 3207C8 STA OPORT
C90C AF XRA A ;SET DELETE FLAG AND CR FLAG TO 0
C90D 32AAC9 STA CRFLAG
C910 32A9C9 STA DELFL
C913 CD1FC0 TERM1: CALL SINP
C916 CA36C9 JZ TIN
C919 47 MOV B,A ;HERE IF DATA, SAVE IT
C91A FE80 CPI MODE ;IS IT A COMMAND MODE?
C91C CAC0C1 JZ COMN1 ;YES -- GET OUT OF PTERM AND RETURN TO
C91F DA28C9 JC TOUT ;NON CURSOR KEY, SEND TO TERM PORT
C922 CD54C0 CALL VDMOT ;TO THE VDM IF IT IS A CURSOR CONTROL
C925 C336C9 JMP TIN
C928 FE7F TOUT: CPI 7FH ;IS IT A DELET CHAR?
C92A C230C9 JNZ NODEL ;NO, SO SKIP THE STORE
C92D 32A9C9 STA DELFL ;MAKE FLAG NON ZERO
C930 CD97C9 NODEL: CALL POUT ;CAN SENT TO TERM PORT
C933 C230C9 JNZ NODEL ;BUSY IF NOT ZERO ON RFTURN
C936 CDA0C9 TIN: CALL PIN ;POLL PAR INPUT PORT
C939 CA13C9 JZ TERM1 ;IF NOTHING, LOOP
; THE HIGH ORDER BIT IS PURPOSELY NOT MASKED HERE SO THAT
; THE EXT. DEVICE CAN SEND SCREEN CONTROL CHARACTERS TO THE
; SOL VDM.
; IF THIS IS NOT DESIRED, PLACE AN ANI 7FH HERE
C93C FE80 CPI MODE ;DO NOT ALLOW A RETURN TO SOLOS HERE
C93E CA13C9 JZ TERM1 ;ALSO IF 80H
C941 47 MOV B,A ;SAVE IT
C942 FE1B CPI ESC ;CONTROL CHAR IF BELOW 1B
C944 D27AC9 JNC TERM2 ;IF A PRINTABLE CHAR, WILL HAVE A CARRY
C947 FE0D CPI CRRET
C949 C25AC9 JNZ NOCR ;SKIP COLUMN TEST IF NO CARR RET
C94C 3AAAC9 LDA CRFLAG ;TEST TO SEE IF LAST CHAR WAS CR
C94F B7 ORA A ;SET FLAGS
C950 C213C9 JNZ TERM1 ;DO NOT PRINT IF SO
C953 78 MOV A,B ;CARR RTN BACK TO A

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C954 32AAC9      STA      CRFLAG ;MAKE NON ZERO
C957 C381C9      JMP      TERM3  ;NO, SO PRINT IT
C95A AF          NOCR:   XRA      A          ;MAKE CRFLAG ZERO
C95B 32AAC9      STA      CRFLAG
C95E 78          MOV      A,B
C95F FE0A        CPI      LF          ;TEST FOR LINE FEED
C961 CA7AC9      JZ       TERM2
C964 3A0CC8      LDA      ESCFL     ;ESCAPE FLAG
C967 B7          ORA      A
C968 C27AC9      JNZ      TERM2
C96B C5          PUSH     B          ;SAVE B REG
C96C 061B        MVI     B,ESC
C96E CD54C0      CALL    VDMOT     ;DISPLAY IT
C971 0607        MVI     B,7
C973 CD54C0      CALL    VDMOT
C976 C1          POP      B          ;RESTORE
C977 C381C9      JMP      TERM3
C97A 3AA9C9      TERM2:  LDA      DELFL  ;TEST FOR A PREVIOUS DELETE CHAR
C97D B7          ORA      A          ;ZERO IF NONE
C97E C287C9      JNZ      NPRNT    ;OTHERWISE DON'T PRINT IT
C981 CD19C0      TERM3:  CALL    SOUT     ;HERE TO PRINT TO CURRENT DEVICE
C984 C313C9      JMP      TERM1    ;AND LOOP AND LOOP AND LOOP
C987 78          NPRNT:  MOV      A,B    ;GET THE CHAR IN A
C988 FE7F        CPI      7FH      ;IS IT A DELETE CHAR?
C98A CA13C9      JZ       TERM1    ;DON' ALLOW IT IF SO
C98D 3E00        MVI     A,0       ;ZERO THE DELETE FLAG HERE
C98F 32A9C9      STA      DELFL
C992 065F        MVI     B,5FH     ;SEND A BACKSPACE INSTEAD
C994 C381C9      JMP      TERM3

;*****
; PARALLEL OUTPUT ROUTINE
;PSFUDO PORT 02
; DATA TO BE OUTPUT IS IN B
C997 DBFA      POUT:   IN       STAPT
C999 E604      ANI      PXDR    ;CHECK EXT DEVICE READY LINE
C99B C0        RNZ      ;RETURN IF BUFFER FULL
C99C 78        MOV      A,B    ;DATA IN ACC
C99D D3FD      OUT      PDATA
C99F C9        RET

;*****
; PARALLEL INPUT ROUTINE
; PSEUDO PORT 02
; DATA RETURNED IN A
C9A0 DBFA      PIN:    IN       STAPT ;GET STATUS
C9A2 2F        CMA
C9A4 E602      ANI      PDR     ;DATA?
C9A5 C8        RZ       ;RET WITH Z FLAG SET IF NOT
C9A6 DBFD      IN       PDATA ;GET DATA
C9A8 C9        RET

;
;
C9A9 00      DELFL  DB      0      ;DELETE FLAG STORAGE BYTE
C9AA 00      CRFLAG DB      0      ;CARR RETURN FLAG
C9AB                END

```

SAN JOSE NEWS, WEDNESDAY, JANUARY 18, 1978

By **LARRY KRAMER**
Washington Post

LAKE CITY, Mich. — When a struggling young electronics firm develops a device that prolongs and protects the life of appliances and just might also cut energy consumption by 10 or 15 percent, it could be expected that the accomplishment would be hailed.

But that has not been the case for W.N. Phillips Inc., a small precision electronic equipment company in this Michigan hamlet, which manufacturers "Power Master," a device described as a transient voltage suppressor.

When Bill Phillips founded his little firm five years ago, he was trying to develop a product that would help prolong the life of appliances and other equipment that use electric power.

Because of "surges" or "transients" that Phillips said were frequently found on power lines, some electronic equipment could be affected by the changes in voltage.

The Power Master is the name of the device Phillips designed to counteract those surges and thus lessen the wear and tear on electronic equipment. To the lay person, it is only a little black box that could be anything, since Phillips does not give out the specifications of its Power Master.

One example of a successful application of Power Master is the Boston Herald-American, a large daily newspaper.

The Herald was experiencing problems with its new computerized typesetting system. Like many major newspapers, the Herald has begun the transformation to what is known as "cold-type," or photocomposition, and had begun to set the type on video display terminals, computers which appear similar to television screens with typewriter keyboards attached.

There were frequent problems at the Herald when the computer system would "crash," causing the screens to go blank, and stories that reporters had written and typed into the computer system would disappear.

Acting on the advice of a computer consultant, Herald produc-

tion man Jack Parker decided to see if the problem was related to transients in the power lines.

"We put in the Power Master units in all the areas where we had computer problems," Parker said, "because we thought we might be having line problems. We were right. It turned out that our presses were generating the transients and causing us to lose stories."

"Now," Parker said, "since we put in the units, we haven't had any problems. We are installing some additional units near the presses, because we think our presses may be affecting other customers on the same power lines."

⋮

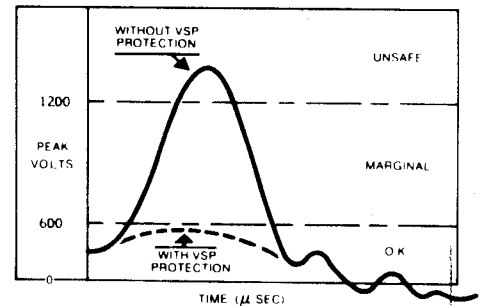
what are voltage spikes?

Voltage spikes are brief high-voltage surges that can occur in any electrical system. Most common causes in home circuits include:

- Lightning strikes near power lines
- Switching OFF and ON appliances within the building (such as an air conditioner or oil burner furnace).

Voltage spikes of less than 600 volts pose little threat of damage to most electronic equipment. Household spikes as high as 2,500 volts have been recorded, however, and at such extreme voltages there is a high risk of destroying solid-state components that are not protected against spikes.

The GE VSP absorbs excess spike energy and allows only a safe voltage level to enter the protected equipment. This clamping action is diagrammed.



Transient protection for minis, micros and terminals

Transtector systems ACP100B offer transient protection for mini computers, microprocessors and computer terminals. The ACP100B plugs into any standard (grounded) wall plug to provide immediate protection from hazardous transient surge, high voltage or high line condition. In operation a multiple stage transient voltage suppressor works in 5 nanoseconds to suppress (clip) overvoltages. After each transient the protector automatically resets to be ready for the next occurrence. The ACP100B will suppress most induced surges from lightning. However, it is not designed for direct strike. Available from stock, the ACP100B is priced at \$119 for most mini applications.

Transtector Systems, 532 Monterey Pass Rd., Monterey Park, CA 91754. (213) 283-9278.

GESP-752

VOLTAGE SPIKE PROTECTOR
WITH GE-MOV® VARISTOR

MAXIMUM RATINGS	LINE VOLTAGE	LINE CURRENT
V.A.C.	125V	@ 15A
SUPPRESSED VOLTAGE	500V	15A SURGE FOR 20 μ SEC.

MADE IN U.S.A.

\$10.00

A simple, compact spike protector, but notice the 20 microsecond response time. The one to the left costs 10 times as much but has a 5 nanosecond response. I have no specifications on the "Power Master."

Can anyone separate fact from fiction on these little black boxes? What do we really need? The GESP-752 may protect my SOL from damage, but it sure doesn't protect it from temporary insanity when my washing machine goes "clunk!"

--Editor

LETTERS

I am enclosing \$10 for next year's dues. I would also like to report on interfacing an Axiom EX-800 printer to the SOL. The Axiom printer does not have a ready signal, instead it has an acknowledge line which does not have the proper timing. I connected jumper J3 in the printer and wired it to the SOL's parallel output as shown:

AXIOM	SOL	FUNCTION
Pin 7	Pin 2	Signal Ground
Pin 23	Pin 19	Data Bit 6 (bit 7 not used)
Pin 21	Pin 20	Data Bit 5
Pin 19	Pin 21	Data Bit 4
Pin 18	Pin 22	Data Bit 3
Pin 17	Pin 23	Data Bit 2
Pin 16	Pin 24	Data Bit 1
Pin 15	Pin 25	Data Bit 0 (lsb)
Pin 10	Pin 17	NOT Strobe/Not Output Load
Pin 14	Pin 16	ACK/NOT XDR

A copy of the software driver is attached. It is written to be compatible with ALS-8 which explains the strange location and deleting the delete (ALS-8 outputs two deletes after each carriage return.

It should be noted that this paper can not be erased. It will take pencil and some inks. Also for fine lined permanent writing I use a test probe with 5 to 10 volts on it realize to the rest of the paper.

An Axiom rep at one of the trade shows said they in Feb. they will be coming out with a mod to print 6 lines per inch instead of the current 5. I must note however that he also said that I could get a part to convert to 8 lines/inch now for \$4-5 when I wrote the factory they quoted \$42!!! other than that I am very happy with the unit.

How often will your newsletters be coming out? Does anyone know anything about the source listing for Basic5 which was promised in PT's ads about a year ago? I assume that by now you know about MSA's 8K BASIS for Sol. It is almost the same as MITS 8k 4.0 except comes with almost no documentation i.e. they don't even give the address for the USR command; however since it is so close to the MITS that the same locations are used (for USR the user's subroutine address goes locations 0049 and 004A hex low byte first.) Also the tape routine's are not in the normal format.

I have patches for both MITS 8k and Extended 3.2 (?) which are compatible with SOLUS in addition the useless CONSOLE has been replaced with SETOUT = which does the obvious and with port 3 called it will call an Axiom routine.

DE30		0000 *		OUTPUT DRIVER FOR AXIOM EX-800
DE30	C5	0010	PUSH	B
DE31	DB FA	0015	WAIT IN	STAT
DE33	E6 04	0020	ANI	MASK
DE35	C2 31 DE	0025	JNZ	WAIT
DE38	78	0030	MOV	A,B
DE39	FE 7F	0035	CPI	DEL MAKE COMPATIBLE WITH ALS-8
DE3B	CA 4F DE	0040	JZ	NEXT
DE3E	0E 70	0045	MVI	C,70H DELAY TO SLOW DOWN
DE40	0D	0050	TIME DCR	C TO AXIOM'S SPEED
DE41	C2 40 DE	0055	JNZ	TIME

(CONTINUED)

DE44	D3	FD	0060	OUT	PRL
DE46	D5		0065	PUSH	D
DE47	E5		0070	PUSH	H
DE48	F5		0075	PUSH	PSW
DE49	CD	19 C0	0080	CALL	SOUT OUT TO VDM ALSO
DE4C	F1		0085	POP	PSW
DE4D	E1		0090	POP	H
DE4E	D1		0095	POP	D
DE4F	C1		0100	NEXT POP	B
DE50	C9		0105	RET	
DE51			0110	PSW EQU	6
DE51			0115	STAT EQU	0FAH
DE51			0120	MASK EQU	04H
DE51			0125	PRL EQU	0FDH
DE51			0130	SOUT EQU	0C019H
DE51			0135	DEL EQU	7FH

DEL	007F	0035
MASK	0004	0020
NEXT	DE4F	0040
PRL	00FD	0060
PSW	0006	0075
SOUT	C019	0080
STAT	00FA	0015
TIME	DE40	0055
WAIT	DE31	0025

(Editor's note: We tried printing directly from the Axiom's aluminized paper that Bruce listed his letter on, but it didn't photograph well for the photo-offset plates.)

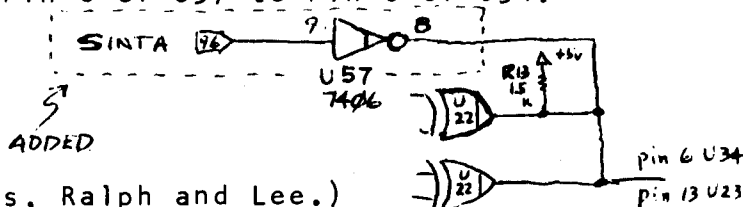
Bruce Barron

Greetings. Lee Felsenstein has been kind enough to provide the enclosed information on the necessary changes for modifying a revision D Sol-PC board for use with vectorred interrupts which includes tapping an otherwise unassociated gate! A somewhat more textual explanation will appear in ACCESS. I would have sent this information last week but instead became involved in preparing an exhibit for a show in which we're currently participating.

I agree that all change notices should specify the revision level for which the information applies. Our internally circulated engineering change notices do reflect this data. I'll see what I can do with our documentation group to effect this.

Ralph IL Palsson
Customer Applications Manager
Processor Technology

(Editor: The letter above was Ralph's reply to my request for a retrofix to Rev. D-SOL's which will let them work properly with interrupts. Ralph is an unusual person in that he does what he says he'll do and in a timely manner. The accompanying blueprint he sent shows the partial schematic below and the instructions: "On bottom (solder) side of SOL PC Board, add jumper wires (24 AWG or smaller, insulated) from Pin 96 of J10 to Pin 9 of U57, and from Pin 8 of U57 to Pin 6 of U34."



Thanks, Ralph and Lee.)

Did you know that the Helios II (unlike North Star, Micropolis, ICOM, and Digital Systems floppy units) does not have a physical write protect? Obviously, Processor Technology did not want to spend the extra money to make this valuable feature available. Therefore, the physical write protect slot, which is standard on all diskettes I've seen, is absolutely useless. Also Space-Byte's 16k static memories are flaky on a Helios II. I also can't get my TDL Z80 CPU to work with my Helios II, though my IMSAI 8080 works fine with it.

This is in response to Joe Maguire's Oct.25,1977 request for an 8080 driver for the Digital Group impact printer that he's hooked-up to his SOL-20. Yes, I have an 8080 driver for that printer. If he needs it, tell him to write me and I'll send him a copy. Me and two other friends are working with the printer being used by the Digital Group. One of us actually bought the Digital Group printer. The interface electronics (which is just a parallel port) is actually quite simple. However, the power supply was really done crummy and dangerously. It would not be that difficult to burn-out your printer because of some software or minor hardware glitch in your system. The sloppy Digital Group power supply design for their printer really surprised my two hardware friends since they felt the design on all of Digital Group's other products was pretty solid. For example, if you turned-off the power to your computer and your printer at the same time, the fuse on the Digital Group interface board would pop! Also not all of the secondary AC is completely isolated from the digital electronics. There are other things wrong too, but would take too long to explain here. My two hardware friends are re-designing the Digital Group power supply and interface electronics to the printer, which is manufactured by Practical Automation. Re-designing the power supply is a little bit tricky because the power supply requirements of the Practical Automation printer are really strange.

Ken Young
3311 W. 3rd Street, Apt.1-319
Los Angeles, California 90020

I use my SOL 20 for hobby and would like to get in touch with anyone who uses it with ham gear. I am a ham and my call sign is VE3CJC.

I would also be interested in any commercial programs that have been developed as well.

I am also trying to interface the Digital Group printer to the SOL with no luck yet. Maybe someone has already committed hari kari and I can take over from him on this problem ha ha.

E. B. Robinson
Trenton, Ontario

Here's something you might put in Bits & Pieces. I'd like to know how to disable the moving cursor under the short range scanner in TREK-80-that really bugs me, that thing going back and forth. Also I'm anxious to hear how that Vandenburg 16K static board works in a SOL.

Larry Leranthe
Colo. Spgs., Colo.

I have the 32K version of the Extensys board - no operating problems, but one big gripe: the 8K blocks of memory are not re-addressable. I suppose this is no problem if you have a full 64K board, but otherwise you must physically move the chips! Since my PT software starts at 0H and my PolyBASIC at 2000H and my ALS-8 needs memory at D000H, this was very annoying. I partially solved my problem with a 4K board which I address at D000H when using ALS-8 (along with bank #8 of the Extensys) and I re-address it at 6000H when running long BASIC programs in PolyBASIC. Of course this still wastes 8K starting at 0H. When PT's 8K BASIC is released, I won't have the problem.

By the way, PT's 5K BASIC is pretty fast when run on a SOL. I did the timing comparisons as published in Kilobaud #6, and 5K BASIC came out near the top when running benchmark program #7. Only the Zapple 8K and Altair 8K running on Altair machines were any faster.

I am happy to report that the number of SOL systems in Regina has doubled since my last report - there are now two of us! I expect it to double again within the next year as there are several people interested in it after I showed off my system at the second meeting of the R.O.M.S. (Regina Organization fo Microcomputer Systems, of which I am co-founder).

Good fortune for all SOL users in '78!

Bob Stek
Regina, Saskatchewan

I have a couple of comments concerning the Oct./Nov. 1977 SOLUS NEWS.

I may have an answer to Dr. Sakurai's problem with a D+7A in a SOL. I had a similar problem. IN port would input a FF sometimes when the DAZZLER was in the bus, while if the DAZZLER wasn't in the bus the D+7A worked correctly. The problem was that I had a TI 8080 which came with the SOL, when I changed it to an Intel 8080A everything worked right. I tried two other 8080 chips and a different brand of 8080A which did not work. A Radio Shack 8080A chip did work also. I don't know why the difference in the 8080 and 8080A, but I tried everything in a different SOL and the same thing happened.

I was very interested in the article on Selectrics. I have an A-J 841 also interfaced with a 3P+S. The driver which I wrote for it for both input and output uses 100 hex bytes plus 100 hex bytes for the look-up table. If anyone is interested in this program, I would be glad to send them a copy.

Jim Dixon
RR3 Box 151A
Alexandria, IN 46001

I was quite happy to hear about the formation of SOLUS in Byte Magazine. I have recently assembled a SOL-20 and am eager to start programming it. It sure would be nice to swap software with other SOL users. May I suggest that there be a column in your newsletter

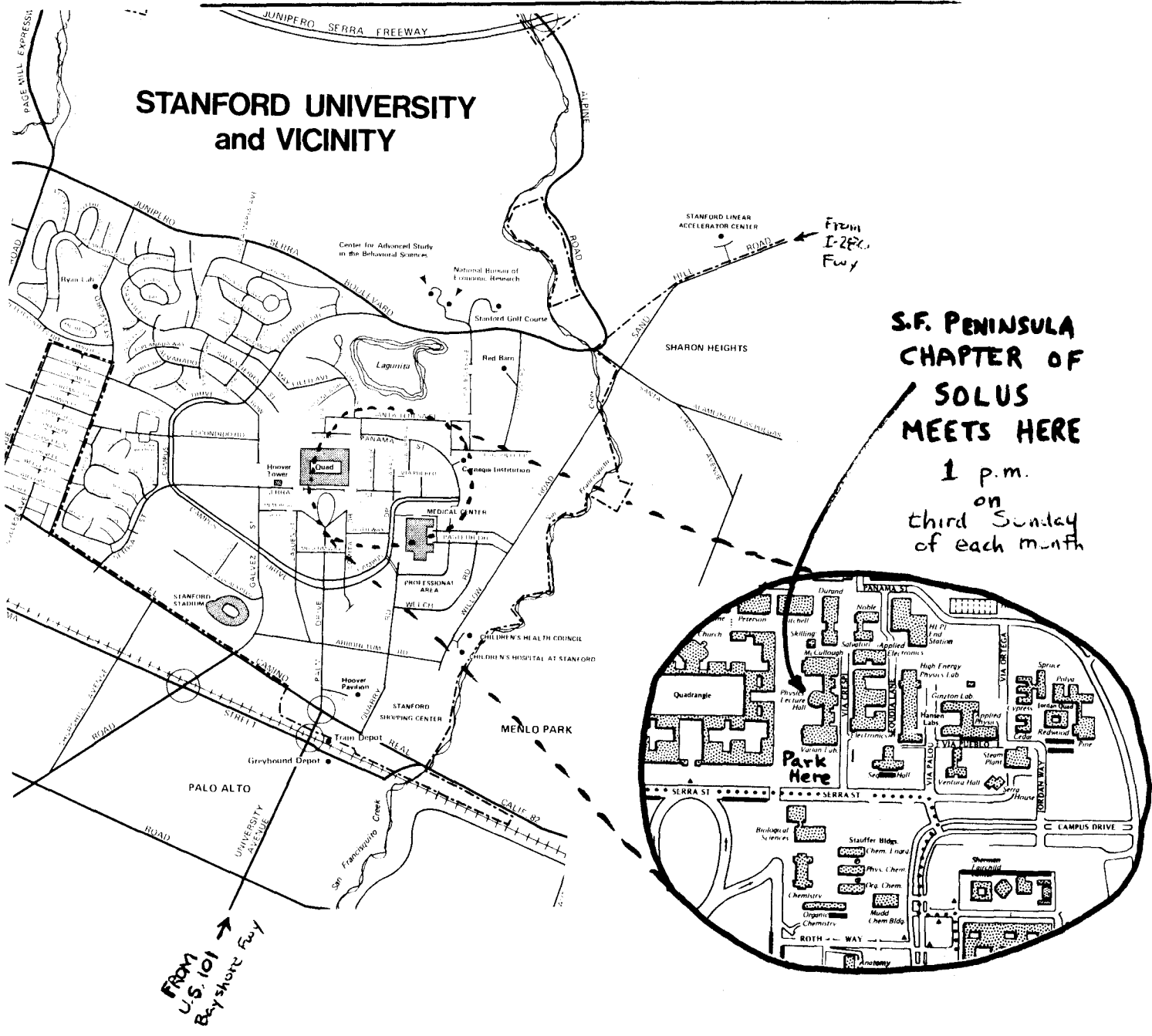
describing requirements for decent system software and an action plan for the design and implementation of this software. I don't think we can depend on Processor Tech to dream up what we really need.

Some examples of useful software we could all use are:

1. A full screen, multi-file editor with such features as:
'BLOCK' MOVE, DELETE, COPY, BLOCK MOVE ↔
MERGE FILES; TAB SETTING. ALS-8 could be used as a base.
2. A high level compiler like PL/1, PASCAL (or if you must BASIC)
3. A linkage editor and loader

I would be quite willing to work with members to produce any of the above or to get involved with more detailed specifications.

Peter Needham
Richmond, B.C.



LOST SOUL

The following member(s) have an incorrect address in our files and we have been unable to reach them. If you know anyone on the list please have him write to us so he can continue (or begin) receiving the mailings.

Doug S. Miller, Menlo Park, CA

CONSUMER PROTECTION

If you are ordering a 16K Static RAM from "Seattle Computer Products, Inc." using the Group Discount offered in Vol.1, No 1, please let us know so we can audit the amount of rebate they send you. We recommend you seriously consider purchasing it assembled rather than as a kit because of the 10-day return privilege and the better warranty. Never pay in advance. This board uses the same memory chip as the Artec 32K board, which we've seen used in SOL with DMA devices, so it should be fine - but one never knows for sure.

SOLUS NEWS
Stan Sokolow, Editor
1690 Woodside Road, #219
Redwood City, CA 94061

F I R S T C L A S S

SOLUS NEWS

Vol. 1, No. 3 SOL Users' Society APRIL 1978

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Contributing Editor: Ron Parsons Austin, Texas

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Permission granted to reproduce computer programs herein, provided that the source is given credit.

DUES REMINDER

We still have many names on our mailing list who haven't sent in the current year's dues. We are about to purge these names from the list. If you are one of these folks, read this issue. If you still feel we are doing something relevant to your needs and deserving of your support, send in your dues. Remember it's \$10 in the US. (See above for foreign and special memberships.) If we don't hear from you, this is your

LAST ISSUE!

We also want to remind new members that memberships run on a calendar year (Jan thru Dec) basis. Members who join mid-year should receive the current year's issues back to January. If you don't, let us know. Allow about a month for processing...we're all doing this in our spare time.

One last thing: Those who sent us \$4 dues in response to the erroneous note in Kilobaud, please send in the balance of your dues. That note was sent to the magazine in 1977 when the dues were \$4, but wasn't published until it was outdated.

NEW FORMAT

Take a peek inside and you'll see we are trying a new format for SOLUS NEWS. We are trying to pack more into the same number of pages. At the same time we are hoping to be able to give more rapid turn around on letters we receive. To do this, we are reducing the letters and articles we receive to half size. They are the actual letters themselves, not retyped, and only slightly edited with a pair of scissors. Authors should be sure to use a dark ribbon so their letters reproduce well. Letters that require retyping will get into print much slower than camera-ready ones. In the future we may be able to take letters on cassettes and let a word processor do the work, but we don't yet have the software for this. Anyone interested in working on that should contact the editor.

2nd WEST COAST COMPUTER FAIRE

As we reported in the last issue, SOLUS had a commercial sized booth at the Faire held in San Jose on March 3 thru March 5. Processor Technology donated it to us. It was a good way for us

to recruit new members, and it made a great hang-out for members of the local chapter. We recommend this sort of activity for all of our other local chapters. If a club booth is not available at your area's computer show, contact us and we'll see if P.T. is interested in sponsoring a commercial booth there.

We also had a general meeting at the Faire, which was attended by over 100 people. Members of the SOLUS steering committee reported on our general activities and got lots of good feedback from members. Some suggested that we put on a program at each of the local chapters, directed at the novice who can't even understand the basics of operating the SOL. One person suggested we develop a self-tutorial cassette tape (audio recording) that leads the user thru the steps of getting his SOL (assembled) to talk back to him on the screen. (Processor Tech's Ralph Palsson told your editor that P.T. realizes the manual is not good for the 100% novice to computers, and they are considering printing a beginner's guide.) Some people came up to volunteer for various projects.

Another activity SOLUS engaged in at the Faire was rounding up new products for our Hardware and Software Reviewers. We'll report on these in the coming months.

NEW CHAPTERS

Rochester, NY: Warren Harkness, 32 Larchwood Dr, Pittsford, NY 14534.

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To join a local chapter, contact the coordinator directly. Each chapter is free to organize as its members desire. Chapters are provided so SOLUS members are able to meet face-to-face, trade software, tinker with hardware, visit local manufacturers, hear lectures from invited speakers, etc. If you would like to start a chapter in your area, send SOLUS your chapter area name, and the name and address of the coordinator to publish here. We'll print the whole list twice a year, and updates in each issue. Local chapters are encouraged to write to us so we can hear what you are doing.

DOCUMENTATION NOTES

Here's a potentially dangerous error in the SOL systems manual reported by Warren Harkness. On page AVII-3 (appendix) the description of S-100 pin 2 function is correct, but the SYMBOL and NAME should be +16v not -16v. Warren wrote "Please publish that so no one else assumes pins 2 (+16v) and 52 (-16v) which are across from each other, are the same voltage. I tried to measure voltage there one time, shorted 2 and 52, and blew my power supply." Pin 52 is correctly designated -16v. on Page AVII-4.

HARDWARE NOTES

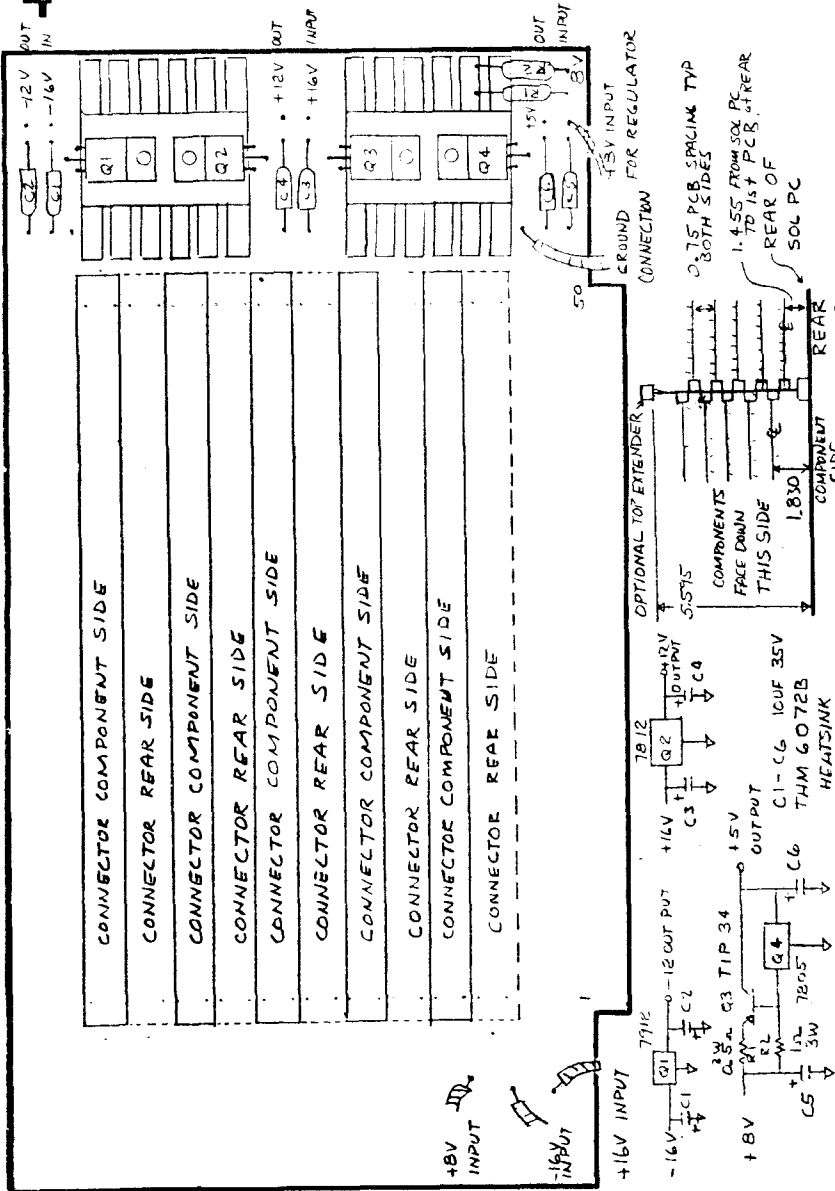
At the February meeting of the S.F. Peninsula chapter, David Fylstra reported on a PC board which has impressed him with its unique features. It is a backplane board similar to the one which Processor Technology makes to plug into the SOL S-100 connector providing the 5 slots on the SOL-20 card rack. However, this "daughter board" provides 10 slots in about the same height, five on the front, and five on the back. It won't fit a SOL-20 case, but Dave is home-brewing his own SOL system from the SOL-PC, so he doesn't care. The board also has a regulator circuit to provide the regulated voltages needed by the SOL-PC itself. The board is made by Forrest Duston, 885 Aster Avenue, Palatine, IL 60067. The same fellow also makes a sheet metal card cage to support the boards, and an 8K RAM board. Contact him for more info. See the illustration in this issue for a sketch of the "daughter board." (Page 4)

Ron Parsons wrote, "I would be interested in being contacted by anyone who has successfully attached an expansion backplane with five or more slots to a SOL-20." We have heard at the 2nd West Coast Computer Faire that an S-100 manufacturer who makes a terminated-bus computer has a working prototype for adding his box and motherboard to the SOL as an expansion accessory. The problem is not easily solved--you can't just run a couple of ribbon cables out to a motherboard because of such things as noise, transmission delay, and bus loading. What works for some boards plugged in out there, may not work for others. Processor Tech is looking for such an expansion method too. If anyone has done it successfully, please let us know how so Ron and the rest of us can give our SOL's some growing room.

Bill Fuller, of Grand Prairie TX, wrote that most Z-80 cpu's do not support the S-100 interrupt enable INTE output. If converting the SOL to Z-80 (such as with the Dutronics adapter) be sure to check for that signal being generated, otherwise the P.T. Co. music board won't work. It uses that signal to make the music. We hope anyone considering the Dutronics adapter for the SOL reads the hardware review in this and previous issues before making the purchase.

Anne Weiss, of Somerset NJ, asked if we know of any device to eliminate interference from SOL to a TV in the same house, especially on channels 2 and 4. Ham radio operators have had similar interference problems. Some of the radio frequency interference comes out of the gaps in the SOL case and a lot comes out along the AC power cord, or so we've been told. Good grounding of both sheet metal covers of SOL to the chassis and installation of a CORCOM RFI power line filter #3EP1 will help. The filter costs about \$10 and is almost a direct replacement for the normal SOL power cord receptacle on the back wall of the power supply. More details are in the Vol 0, No 1 issue of SOLUS NEWS. Another solution is a one-piece metal cover for SOL sold by CURTIS ELECTRO-DEVICES, Box 4090, Mountain View, CA 94040. They make this case and RFI filter for use in their amateur radio system. It costs about \$100.

In the last issue, I asked if anyone knew how to protect against the temporary insanity my SOL goes into when my washing machine is running at the same time. Simple voltage spike protectors don't help much. The Letters section of this issue has a couple of replies.



FORREST DUSTON'S SOL DAUGHTER BOARD

See hardware notes

My Sol and CP/M - - - and a Helios???

By Ron Parsons
Austin, Texas

One disadvantage of Processor Tech's PTDOS and Helios II is the unique format of PTDOS diskettes. This was discussed in the articles by Stan Sokolow and myself in the Jan./Feb. 1978 SOLUS NEWS. There is a large amount of CP/M software available on standard format soft-sectored diskettes. Because I already had the most expensive part of a CP/M disk system (the PerSci drive in my Helios), I wondered how could I use it with CP/M and PTDOS concurrently?

I had several objectives to satisfy: a) No modification should be needed to any of the Helios hardware or software, b) Switching between PTDOS and CP/M should be under software control, and c) There must be a way to transfer files from one OS to the other.

My solution was to use a Tarbell Floppy Disk Interface Board to act as a controller for CP/M. The Tarbell controller uses a 1771 LSI disk controller chip for controlling and formatting soft sectored diskettes. The board puts the processor in a wait state while waiting for the disk request to complete. DMA is not used as in the Helios for controller-memory data transfer. Thus there is very little time spent in the wait state except during seeks. This board has four spare 16 pin IC slots and space for two 50 pin headers for ribbon cable. With four additional ICs (hex tri-state buffers) and a few unused gates scattered around the board, I installed a multiplexer for the signal lines from the controller (now controllers) to the PerSci drive. The multiplexer state is set by a software command (an OUT instruction). The signals from the drive to the controllers are not multiplexed. The 50 wire cable from the drive connects to the header J1 on the Tarbell board and a short six inch jumper cable connects the Helios controller to header J2 on the Tarbell board. I burned both the PTDOS and CP/M bootstraps into my 2706 version of SOLOS in place of TERM and cassette byte routines. The CP/M boot requires zero wait states. This was done by lifting pin U71-11 on the main Sol board. I also added a one second one-shot timer to the head load circuit so the head remains loaded for one second after the 1771 "releases" it. This eliminates the wear and noise associated repetitive loading and unloading of the head.

The only problem I encountered with the Tarbell interface was due to an unterminated S-100 bus line (54 - external clear). Noise, probably from XRDY, occasionally cleared a latch. This caused the PerSci drive to switch randomly from disk 1 to 0. Tying this line high with a 2.2k resistor cured the problem.

Creating and debugging the CBIOS (the hardware dependent part of CP/M) was very easy since it could be assembled and tested under control of PTDOS. The STEP output from the 1771 chip was not used. Instead, stepping pulses under software control were used to take advantage of the fast seek capability of the PerSci drive.

Since the PTDOS bootstrap uses the first 340H of memory, I've established 400H as the origin of all programs and files to be shared between PTDOS and CP/M. I also had to write conversion routines for source files as the PTDOS format is (text)(CR) while the CP/M format is (text)(CR)(LF). Now the world of CP/M programs is available to me. However, because PTDOS is so much more powerful than CP/M, I often find that I transfer files from CP/M to PTDOS for processing.

Solus Hardware Review

by

A. T. Atey

In this month's column we shall discuss the Dutronics DZ80-80R Z80 adapter board, the Extensys RM64 dynamic memory board, and also the Tarbell 1011A floppy disk controller board. The Dutronics board was supplied to SOLUS courtesy of Mr. Dave Dutra of Dutronics. The Extensys board was loaned to SOLUS for evaluation by Mr. Dan Pichulo of Extensys. The Tarbell board was purchased as a bare board and built up for use mainly in his Altair 8800.

Evaluations have been performed by the author and two of his colleagues, Messers. I. Hartley Wurkz and Seymour Bugs. It should be noted that all three of us are using SOLs which were built from boards, and each is uniquely packaged and expanded.

Dutronics DZ80-80R

The Dutronics DZ80-80R Z80 adapter board is a small (2.75 x 5.5 inch) circuit board which includes a Z80 CPU chip and twelve additional support chips. It is designed to plug into the forty pin socket in place of an 8080 chip and thus provide the power of the Z80 instruction set in a system originally designed for the 8080. It is especially attractive for SOL owners because the SOL does not have an S100 bus CPU card which can be replaced by one of the S100 bus Z80 CPU cards now available from several sources. Unfortunately, it proves to be quite difficult to fool the SOL into thinking that the DZ80-80R is an 8080!

Several months ago SOLUS received a prototype DZ80-80R board for evaluation in SOL applications. After some use, several problems became apparent, specifically pertaining to proper response to the onboard SOL-generated wait states, and writing to the parallel output port. Dutronics was notified, and Mr. Dutra personally visited the author's home, bringing along his own test equipment to observe the symptoms. Just before Thanksgiving, 1977, Dutronics supplied a new board, with several modifications installed, which supposedly fixed all known problems with the DZ80-80R when used in a SOL. The author made the same modifications to the older prototype board which he still had, and gave the new board to Mr. I. Hartley Wurkz for testing in his SOL.

Mr. Wurkz reports that the Dutronics board worked in his SOL with static memory boards using 21L02 type memory chips. It did not work reliably when using the Extensys memory board, however. (Programs tended to "blow up" when using the Dutronics board and Extensys board at the same time. The Extensys board worked reliably with an Intel 8080A.) The parallel port worked OK with the fixes made by Dutronics. (Mr. Wurkz uses the parallel port for interfacing his SOL as a terminal to his IMSAI.)

Mr. Wurkz also reports that before he could read tapes with his SOL while using the Dutronics board, he found it necessary to replace the tape interface UART. (He replaced a GI AY5-1013, which worked fine with the 8080A, with a TI TMS-6011, which then allowed him to read and write tapes properly.) Mr. Wurkz was unable to get the Dutronics board to work in his IMSAI 8080.

Mr. Wurkz then gave the Dutronics board to Mr. Bugs for further testing. Mr. Bugs found that the Dutronics board doesn't act quite right when writing tapes. For some reason the screen display is altered during the writing process, although Mr. Bugs says that the tapes are written correctly and can be read in correctly. He also found that the parallel output port did not work properly in his SOL.

Mr. Bugs agrees that the Extensys board does not work reliably when using the Dutronics board.

The author has found that the Dutronics board (the old one, updated with the same changes as the new one) works somewhat in his SOL. It now works with the parallel output port, which he uses for controlling his I/O Selectric typewriter. He was able to read tapes which had been previously written with an 8080, but found that the SOL display did strange things when trying to write tapes using the Dutronics board. Furthermore, the tapes just written could not be read in without error.

The author has succeeded in getting the Tarbell floppy disk controller to operate in his SOL (using an 8080), but must admit to having had no success in getting it to operate in the SOL with the Dutronics board. This is quite perplexing inasmuch as the Dutronics board has worked quite well in the author's Altair using the Tarbell controller.

CONCLUSIONS:

While you might be able to get the Dutronics DZ80-80R board to operate properly in your particular SOL (hopefully using static memory), we cannot at this time give an unqualified recommendation. If you feel that you want to add the Z80 to your SOL, and that the Dutronics board is the way to do it, be sure to get a guarantee that all parts of your system will work together properly. Based on our experience, it seems likely that just when you think everything is great, you will get a new board, or try something new, which reveals a hitherto unknown bug.

Extensys RM64

The Extensys RM64 memory board is a dynamic memory board designed around Intel 2108 8K dynamic RAM chips. The board gives us the impression of being carefully designed. We noted that the TO-3 style 5-volt regulator did not have a heat sink, and ran rather hot.

An Extensys RM64 dynamic memory board with 48K of installed memory was originally provided to SOLUS by Mr. Dan Pichulo of Extensys at the

October SOLUS meeting. The author promptly plugged it into his Altair, found it wouldn't work there, plugged it into his SOL found it didn't work right there either, and called Mr. Pichulo to find out more. (This particular board had inadvertently been left at the SOLUS meeting, and therefore came with no documentation.) Mr. Pichulo arranged to replace that original board with one which had the necessary modifications, and that board, with documentation, arrived in early December. The evaluation results pertain to the replacement board, serial number 10863-H.

The author immediately found that the new board wouldn't work in his Altair, either. This is probably caused by the fact that Extensys uses pin 3 of the S-100 bus to request wait states. The Altair, as modified per MITS' authorization (as published in Computer Notes), uses pin 3 for the front panel, and is always tied to an active tri-state driver. The transistor on the Extensys board probably can't pull down against the 8T97 on the Altair front panel. Unfortunately, there is no provision on the board for selecting between pins 3 and 72. The 20-page Extensys User's Manual for the RM64, which lists a price of \$10 on the cover, doesn't include a schematic diagram, so it was not possible to try to understand the problem in detail.

The author found that the Extensys board did not operate reliably in his SOL. It appeared to work for short periods, but would inevitably "blow up" sooner or later. For example, if a tape of 12K basic were loaded, and a program then loaded, it would blow (suddenly end up back in SOLOS) when the program was run. It was not possible to run CP/M for any length of time before unpredictable events occurred.

Mr. I. Hartley Wurkz found that the Extensys board worked fine in his SOL as long as he stuck to the 8080. As previously mentioned, however, it did not work with the Dutronics board.

Mr. Wurkz also reports that he tried the Extensys board in his IMSAI and found that it would work from the front panel, but could not be used with his IMSAI floppy disk controller (which uses DMA).

Mr. Wurkz then tried the Extensys board with his Ithaca Audio Z80 board in his IMSAI and found that the memory didn't work at all. The Ithaca Audio board works fine with static memory and the floppy controller's DMA.

Mr. Seymour Bugs found that the Extensys memory would work OK in his SOL with an 8080, but not when using the Dutronics board.

CONCLUSIONS:

The Extensys RM64 dynamic memory board appears to work well in most standard SOLs. The author does not understand why it fails to operate reliably in his particular SOL, when he has been able to run for hours on end with static memory without problem. The Extensys board is a very nice looking board, the first 3-layer S-100 bus board we have seen. It is about 5/16 inch higher than the standard S-100 board, and is extremely densely populated, leaving very little space around the sides. If the high density and low power consumption of this board appeal to you, we suggest again that you only buy it with a

guarantee that it will work properly in your unique system.

Notes on Using the Tarbell Floppy Disk Interface in a SOL

The Tarbell Floppy Disk Interface is a highly versatile board which includes a Western Digital FD1771-01 controller chip along with the necessary interfaces to the S-100 bus and any of several popular floppy disk drives. It also includes a bootstrap circuit and ROM which allows easy loading of an operating system like CP/M in an Altair or IMSAI environment. Before rushing out and buying one, however, SOL owners should be aware that there are certain aspects of the SOL which make using this interface a little less straightforward than when using it in other S-100 bus computers.

The standard port addressing on the Tarbell board is F8 through FC. That group of addresses is already used by the onboard SOL I/O circuits. This precludes using the standard bootstrap PROM which is supplied with the complete kits. (The author did not implement the onboard bootstrap function on his board.) The board does, however, allow easy selection of the port addresses, so it is very easy to write another bootstrap program which works. The author has not tested the onboard bootstrap, either in his Altair, or his SOL.

There is one input port circuit, which Tarbell calls WAIT, in which the tri-state gating logic does not include PDBIN. Because of the bi-directional data bus in the SOL, this WAIT port may not operate properly. It is very straightforward, using spare gate circuits already on the Tarbell board, to correct this omission.

One more thing that may prove to be a problem is that the SOL always inserts one wait state for every onboard memory read or write, and always inserts a wait state for every input and every output instruction, onboard or not. The author, who is using a 2708 personality module, has defeated all memory wait states, and has modified the I/O wait state circuit so that only onboard input and output addresses insert wait states. Proper operation of the wait state circuits is critical for proper operation of the Tarbell interface circuit. Also, all programs which read or write to disk must run in no wait-state memory.

The key element of the Tarbell interface is the Western Digital FD1771-01 chip, and most of the important capabilities and limitations of this interface are those of the 1771 itself. This chip allows use of a variety of soft-sectored formats, allows writing of those formats, and most importantly at the present time, supports the IBM 3740 soft-sectored format. This allows the use of CP/M or other operating systems using IBM format compatible disks. The controller does not support hard sectoring, and is not compatible with controllers such as used in the Helios system.

Figure 1 shows the changes which the author has made to his SOL to defeat memory and offboard I/O wait states. If you are using a 5204 or 6834 personality module, you probably cannot run without the wait state. These changes do not require that any lands be cut or that any new IC's be added.

Figure 2 shows the changes made to the Tarbell board to include PDBIN in the tri-state gating logic for the WAIT input port. Here, one land must be cut, but no new IC's are required.

The author has been running the Tarbell board for almost two months in his Altair with very satisfying results. It worked there fine with the Dutronics Z80 board. He is using 32K of static memory (all 21L02 type). He was unable to try it with the Extensys memory there, because the Extensys memory board didn't work at all in the Altair.

A few days ago, he got around to modifying SOLOS, by replacing the Terminal mode command with a disk bootstrap command. He then proceeded to try various combinations of things in the SOL. What he ended up with as working well is the following set of conditions:

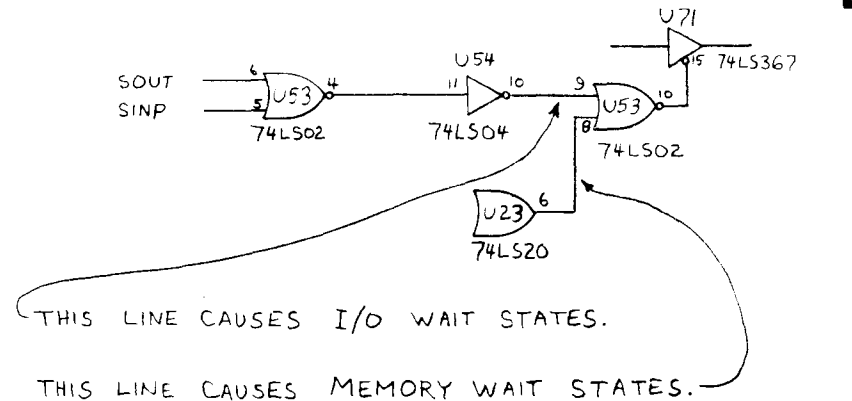
1. 24K of static memory
2. wait states defeated on all memory and offboard I/O
3. 8080 CPU

Under these conditions the system works reliably for hours at a time. The Dutronics board would not work with the Tarbell board in the SOL. It seemed to read in one byte from the disk and then either hang up or get lost. The lack of a front panel on the SOL makes it very hard to know exactly what is happening.

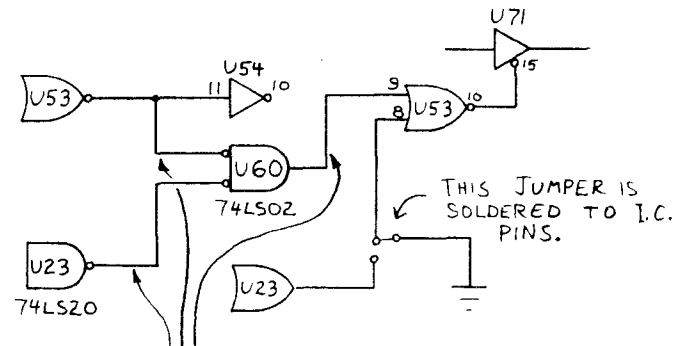
Since the author could not get the Extensys board to operate reliably in either of his computers, he cannot conclude whether or not the Tarbell board would work with the Extensys board.

CONCLUSIONS:

The Tarbell Floppy Disk Interface may be a low cost way for you to get a floppy disk system running on your SOL. It takes a little more effort to use it in the SOL than in other S-100 bus systems, but it is relatively straightforward. Again, there may be incompatibility problems when trying to get this board to work with other equipment.



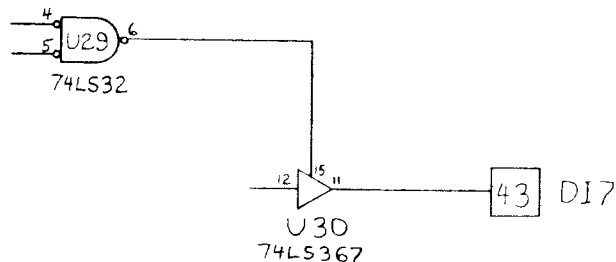
a) Original Circuit



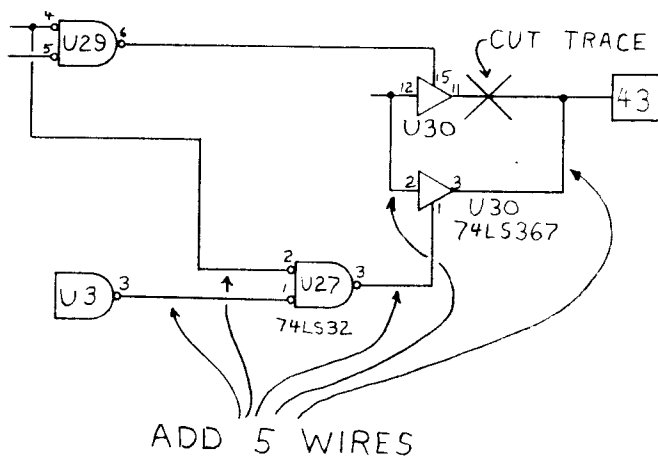
ADD 3 WIRES

- REMOVE U54, BEND PIN 10 OUT, REINSERT IN SOCKET
 REMOVE U53, BEND PIN B OUT, SOLDER JUMPER FROM PIN
 8 TO 7, REINSERT. b) Circuit as Modified

Figure 1.
 Changes to SOL



a) Original Circuit



b) Circuit as Modified

Figure 2.

Tarbell Board Modification

A MINI-REVIEW: THE DOS MOVER

by Bill Burns

Since a large number of Sol owners also own the North Star Micro-Disk System, SOLUS has been trying to improve the integration of these two units. As part of this goal, we worked with and encouraged Bruce Kendall in his efforts to make his DOS relocation programs available. The standard North Star DOS is located at 2000H which conflicts with long Basic-5 programs or long Music System programs, Extended Cassette Basic, and many other programs which have their origin at 0. Starting with the DOS at 2000H, the DOS Mover allows a user to create as many additional versions of DOS as desired and locate them anywhere. I have tested it and it worked perfectly. It even moved the I/O drivers along with the DOS. The documentation is extremely well done. I recommend this package highly and I will do a full review in the next issue. If you don't want to wait you can get the programs on a diskette for \$18.78, plus \$1.22 tax if you live in California, plus \$1.00 for shipping to: Digital Deli Computer Store, 80 West El Camino Real, Mountain View, CA 94041.

PRODUCT REVIEW: TWO "INEXPENSIVE" 16K STATIC MEMORY BOARDS

by Bill Burns

(using the technical knowledge of Ben Milander and Ron Findlay)

Since the five empty slots on the Sol-20 are filling up on most of our systems, "slot conservation" is becoming more important. One 16K memory board IS better than two 8K boards.

Our top technical people have convinced us that unless there is a large price difference, static memories are preferable to dynamic memories. The reasons are: 1) greater simplicity, and 2) less chance of present or future incompatibility with other boards.

When we heard of the Vandenberg Data Products Board (\$330 kit, \$365 assembled) and the Seattle Computer Products Board (\$325 for 450 nsec. chips and \$375 for 250 nsec. chips assembled, but \$375 and \$425 after May 15) we asked for and received an evaluation board from both companies.

Both boards were used for several weeks in a Sol-20 with a North Star Microdisk System. There were no problems except that each initially had a single bad chip. (There evidently is no fully effective memory test. Both of the bad chips passed most of the memory tests that I have accumulated.)

Both boards require "hard-wire" memory addressing instead of using DIP switches. They both use wire-wrap pins on the component side and therefore you must solder or wire wrap each 4K memory block to its starting address. This disadvantage can become an advantage by using a "parallel addressing" scheme. We suggested this possibility to both manufacturers and they both independently came up with the same design. Rod Brock, of Seattle Computer Products, responded with a complete article which is printed elsewhere in this issue. I am testing this now and so far--no problems. It even ran well in a short test using Helios DMA. The Vandenberg mod is identical except that the resistors are 2.2K ohms ($\frac{1}{4}$ watt) and the diodes are either 1N4148 or 1N914. In both cases the companies said they would consider the modification as authorized for warranty purposes.

These are both "good" boards--the choice between them depends on how you view the tradeoff between "fully static" and low power.

Seattle. This board, which uses the TMS 4044 chip (either the 450 nsec. or 250 nsec version) is fully static. The board is well designed, is properly gated for the Sol bidirectional bus, and allows a lot of options for atypical systems. For the Sol the SINP, SOUT, and MWRITE signals should be implemented. The designers have done several things

14 to minimize noise--they have used "bus bars" and separate regulators for each 4K. Also the regulators are on the right which shortens the ground path which minimizes the possibility of ground loops. The board can be disabled using the phantom line, but they did not put a pad next to line 67, so the jumper must be soldered to the top of the socket finger. Also the data input lines are "conditioned" but are not buffered. So far this has not caused any real problems.

The board we tested had the 250 nsec. chips and it ran with everything that we tried it with. (interrupts, and Ithaca Audio Z-80 Board, Imsai Disk System, North Star Disk, Imsai, Helios II, and a Sol.

The major concern is power dissipation. The board uses 1.7 amps nominal and the specs give 9.0 volts as max for the 8 volt supply. Many Sols exceed 9 volts (mine is 9.7 V.). A note on the spec page states, "The input regulators will handle higher voltages than +9, however, special cooling for the regulator heat sinks is required at these higher input voltages." The heat sinks are indeed small and ventilation in the memory board area of the Sol is not good. The warranty defines "unreasonable use" as including input voltages exceeding the spec and temperatures exceeding the spec caused by inadequate cooling. Therefore many Sol owners would need to make some sort of modification to safely use the Seattle board. I have already added a fan on the back of my Sol which blows in over my boards. With this extra fan turned on, the board runs at about the same temperature as it does with an 8 volt supply in an open cabinet, which is about the same as, or even perhaps cooler than most other static memory boards.

Vandenberg. This is a very cool running board even without the fan, since it has very low power consumption (650 ma at +5V., 90 ma at +12V., and 16 ma at -5V.). This is due to the fact that it is not a "fully static" board. The board uses the NEC μ PD410 which is an "edge triggered" memory chip.

Data storage is completely static and does not require refresh. The static storage cell is, however, combined with dynamic peripheral circuits (such as decoders). An activation edge must be provided by the system in order for the chip to generate clocks internally. (An article in the Sept., 1977 Electronic Products Magazine goes into more detail.) The chip has the low power virtues of dynamic memory. Unfortunately it also seems to have at least some of the incompatibility vices. It worked with Imsai DMA and one Helios, but not with another Helios. It did not work with a homebrew interrupt system or an Ithaca Audio Z-80 Board (Vandenberg said it worked fine with theirs). It worked flawlessly during an extended test in a Sol with a North Star Disk.

The inputs are buffered, the read data is properly gated with DBIN for a bi-directional bus, and the regulators are on the right to shorten the ground path. Also, the people at Vandenberg have been very pleasant and helpful, but they lose two points for advertising their board as "static" without any qualification.

Conclusion. The tradeoff between the low power consumption of dynamic chip circuitry and the greater simplicity of fully static chips is one on which reasonable and knowledgeable people will differ. My personal bias is toward trying to stay with fully static memory to minimize the chances of problems with other boards in the future.

PARALLEL ADDRESSING SAVES ON RAM COST

by Rod Brock
Seattle Computer Products Inc.

15

Would you like to buy 8K more RAM for a couple of bucks? Sounds too good to be true. It is. But, in some cases, a couple bucks is all it takes to make your system think it has an extra 8K of RAM.

The problem which many programmers run into is that not all software has its origin at the same address. As an example, North Star begins its software a 2000H. Processor Tech Basic begins at 0000H. Do you "waste" the lower 8K of RAM while running North Star?

There are several solutions. One, you can buy 64K of RAM and forget the problem. Two, you can "relocate" your RAM whenever you switch software. Or three, you can use something called "parallel addressing".

Parallel addressing allows you to have the origin of your RAM at one address for one type of software and at another address for another type. The example we tried with our board in the lab was suggested by Bill Eurns of the Sol User's Society. He is the one who brought the idea to our attention and, as far as we can find out, originated it.

Figure 1 shows the memory map of our example in which 32K of RAM is made to look like 40K to the computer. Two 4K blocks are addressed in parallel by both 0000H to 1FFFH and 8000H to 9FFFH. For software originating at 2000H you have 32K running from 2000H to 9FFFh. For software originating at 0000H, you have 32K running from 000H to 7FFFH. You can switch from one origin to the other "on the fly" without any change to the boards. The two 4K blocks which are "parallel addressed" are shown by the cross hatching on the figure. Other parallel addressing schemes should also work.

Figure 2 shows the circuit of our board after the parallel addressing modification has been made. For the configuration in our example, four 1N34 diodes are required and at least two 10K 1/4 W resistors (Figure 2 shows four resistors to allow for other addressing schemes).

Referring to figure 2, an address input of either 0XXXH or 8XXXH will pull down the number 1 chip select line. The 4K block of RAM connected to the CS1 line will be activated by either address. Similarly, 1XXXH and 9XXXH will both activate the 4K block of RAM connected to CS2. In our example, the RAM connected to CS3 and CS4 will not respond to parallel addressing.

To modify the Seattle Computer Products 16K RAM for parallel addressing, replace the address selection jumpers with 1N34 diodes for the 4K RAM blocks you want to respond to multiple addressing. Make sure the cathode end of the diodes is toward the 74LS138s.

We suggest you put in all four 10K resistors. They mount in the test pads located just to the right of U7. Mount them vertically with their upper ends tied together and then to +5 volts. (The right side of R7 is +5).

Parallel addressing seemed to work fine on our board at room temperature. The scheme does cut down on the noise margins of the circuit a bit and may not work under all temperature and noise environment conditions. We assume the same type of scheme will work with board from other manufacturers if they have a chip select circuit similar to ours.

We consider the modification "authorized" which means it will not affect the one-year warranty on our board. We do not, however, warrant that the modification will work under all conditions--we simply have not tested it enough.

A word of caution: soldering in the modification will void the ten-day return privilege on our board. So, if your decision to keep one of our boards is dependent upon making parallel addressing work, you had

A word of caution: soldering in the modification will void the ten-day return privilege on our board. So, if your decision to keep one of our boards is dependent upon making parallel addressing work, you had better try it first with clip leads.

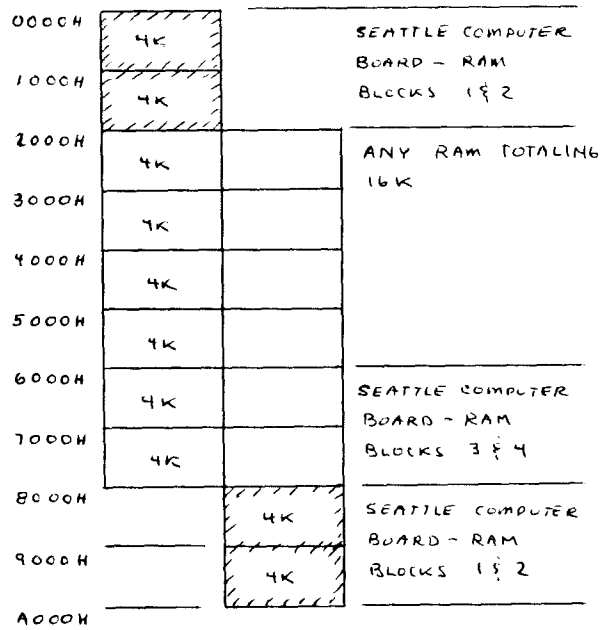


FIGURE 1 — MEMORY MAP SHOWING EFFECT OF PARALLEL ADDRESSING.

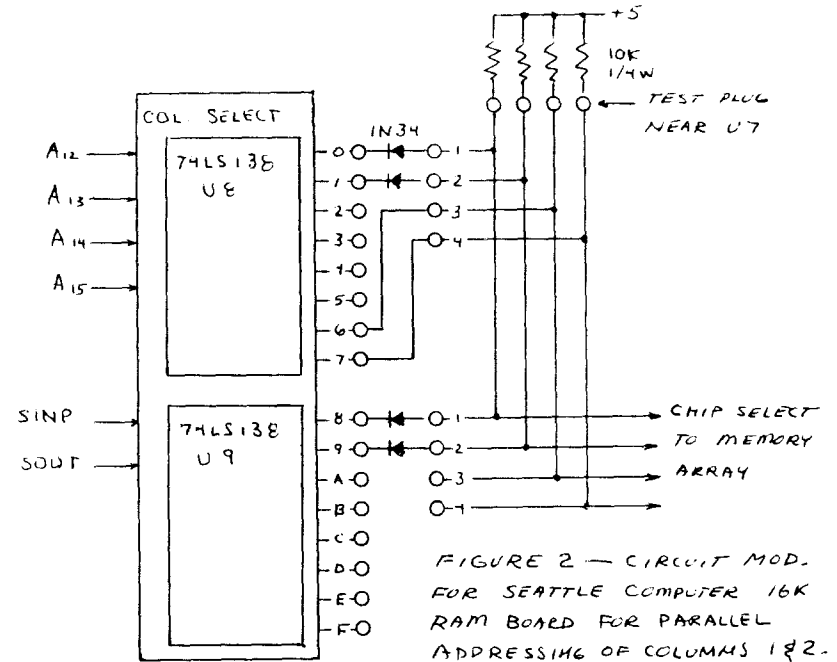


FIGURE 2 — CIRCUIT MOD. FOR SEATTLE COMPUTER 16K RAM BOARD FOR PARALLEL ADDRESSING OF COLUMNS 1 & 2.

On page 3 of the Dec issue, El Lord complained about the lack of provisions in the Micropolis disk operating system for peripherals. Jerry Lenz wrote that he has his printer working under the Micropolis, but not the cassette. The two of them are going to get together to figure out how to drive their peripherals. Anyone with more info is requested to let us know. Has anyone asked Micropolis about this? It is incredible that they would not provide for anything other than the disk and the terminal.

Robert Frase (Germantown, TN) asked if we know any little secret that might help him get his MITS 8K 4.0 EASIC to run on his SOL. Well, we do. It's called Dr. Dobb's Journal, Box E, Menlo Park, CA 94205. In issue number 18 of this publication, a letter from Jack L. Calaway gives the listing of all of the needed patches. We've reproduced the article here for those who don't yet subscribe to this great journal. You really should. It takes no advertizing, so it is free to criticize any manufacturer without fear of being cut off of advertizing revenue. It's on our side. There's a subscription form reproduced here for your convenience.

PTC MAY PRODUCE SOL-HARDWARE DEBUGGER

Processor Technology is contemplating the production of a device that would let one SOL diagnose hardware problems in another SOL. The device, which they proudly call the ParaSol (because it takes a pair of Sol's to make it work), would sell for about \$150 retail, including hardware and software.

ParaSol would consist of a board that plugs into the "sick" Sol and a ribbon cable to connect to the parallel port of the "doctor" Sol. Software in the "doctor" would let the user perform tests that would pinpoint malfunctions in the "patient." They originally intended the product for their dealers only, but if there is enough demand they will make it generally available. SOLUS chapters, computer centers, and other clusters of Sol's may want to share one of these. If you would like one, let PTC know you are interested. Mention you read about it in SOLUS NEWS.

RUMORS

Processor Tech is putting the finishing touches on their FORTRAN. The disk version will be released first, but the cassette version will not be far behind....PT has provided a stipend and a computer with Helios to a UCSD grad student in the portable Pascal project. In exchange they will receive a Helios version of the UC San Diego Pascal system that was discussed at the 2nd West Coast Computer Faire. When? They don't know. Cost? They don't know....PT has a 32KRA dynamic RAM board that has been delivered to dealers only. They haven't advertized it yet because their suppliers can't ship them enough chips yet....PT is still working on their high-density graphics board for the SOL's graphics expansion plug. Rumors say that it will display 208x256 points, using a bit-mapped technique with memory included on the same board. It will have B&W and color, and it will allow graphics intermixed with regular SOL characters. ...Apparently PTC is holding tight to their new policy of not advertizing until the product is on the shelf.

by John Csudar
Homewood, IL

Processor Technology's ALS8 package, as distributed on CUTS tape, loads into RAM at addresses (hex) DF80 through FFFE, and uses D000 through DF7F for system storage. Since most other PT software, including EASIC and games, loads at address 0, users with small amounts of memory (<24K bytes) are forced to switch memory manually between high and low areas. To avoid this, ALS8 may be relocated to occupy addresses C000-2FFE; in fact, with the information given below, relocation to any 1K boundary is possible. A note of warning: software that uses ALS8 utility or return entry points must be modified accordingly! The necessary relocation is accomplished by subtracting an offset from the high-order byte of each address. The offset is given by:

Offset = $D0_{16}$ - (High-order byte of origin of ALS8 system storage)

The information for the steps below was collected through several evenings of listing, changing, and testing, aided by a disassembler/simulator package that I wrote last fall, and an automatic relocater that was published in BYTE.(*). The steps in the relocation process are:

(1) Load ALS8 at address XX80 -- XX is the high-order byte of the start of ALS8 system storage plus OF hex.

(2) Relocate blocks of code listed below.

DF80-E3E5 E47D-E7F0 E80B-EEE4 F022-F62B F634-F9DE
FA00-FA64 FA9C-FB45 FB57-FBC6 FBC8-FFFB

An automatic relocater program should be used for this step.

(3) Manually relocate addresses in the following tables.

E3E6-E47C -- Six-byte entries; last two are high-low address.
FA65-FA9B -- Three-byte entries; last two are low-high address.

(4) Adjust special cases as follows.

E1DF, E1E1, F0BB -- replace D0 with high-order of ALS8 system RAM.
E480 -- replace D1 with high-order of ALS8 system RAM plus one
Instructions at E6A9 and E6C5 -- these should contain address fields of FFFA, which is -6, and must be un-relocated manually. Similarly, the instruction at E4BA should contain FFF9 (= -7). Remember that these go in low-high order (FA FF and not FF FA).

Since relocating ALS8, I have tried most of the features, and all those that I've tried work the same as they did before. The ability to work on assembly language and Extended EASIC programming without constantly opening up my SOL has been a pleasant reward for the work involved.

(*) Ieor Zolman, "A Machine Code Relocator for the 8080",
BYTE V.2 No.7, July 1977, pp. 92-95.

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**PATCHING MICROSOFT'S 4.0 BASIC
ON P.T.'s SOL**

Dear Dr. Dobbs:

77 Sept 5

Just a quick note to pass along a couple of things. First, the kudos and brickbats. The good guys; *Dr. Dobbs*, your publication is the most interesting of all the "home computing" publications. Xybek, and their PROM programming board, a good product with excellent documentation, and people with a genuine desire to help their customers, Micro-Chess, a super chess playing program, with good documentation and priced fairly. The bad guys; the multitude of manufacturers who have promised so much, and have delivered so little, (IMSAI, where's the 12K BASIC, Processor Tech, where's the 8K BASIC so long overdue?).

Attached are the patches I made for a friend so he could use his Altair BASIC on his new Sol. I know you would prefer an assembler listing, but I did these patches by hand. The program should first be loaded, the patches made, and a copy of the modified program be dumped before running the first time. The first column is the old data, the second column is the change. I understand that there may be more than one version of the extended 4.0, so take care that your version is the same as this one.

Thanks for the neat publication. I enjoy it from cover to cover.

Jack L. Calaway
165 E Sierra Madre Blvd
Sierra Madre, CA 91024

P.S. This has been typed using Michael Shrayner's "Electric Pencil Word Processor".

**! PATCHES TO ALTAIR CASSETTE VERSION OF LEVEL 4.0 BASIC
! FOR USE ON A PROCESSOR TECHNOLOGY SOL WITH SOLO
! LOAD THE ORIGINAL PROGRAM, MAKE THE CHANGES AND SAVE
! A COPY BEFORE RUNNING IT.**

ADDRESS	ORIGINAL	CHANGE
---------	----------	--------

! 8K V-4.0

! DISABLE TERMINAL INITIALIZATION, SET UP CUTTER

193A	DB	3E
193B	FF	00
193C	E6	D3
193D	F0	FA
193E	0F	C9

! SEND NULL CHARACTER ON CSAVE, SO CLOAD WORKS OK

0030	00	F5
0031	00	AF
0032	00	D3
0033	00	FB
0034	00	F1
0035	00	06
0036	00	01
0037	00	C9

! OUTPUT TO THE SOLO, RESET THE FLAGS

0547	DB	F1
0548	00	C5
0549	E6	47
054A	00	CD
054B	C2	19
054C	47	C0
054D	05	78
054E	F1	C1
054F	D3	B7
0550	01	C9

Address	Original	Change
---------	----------	--------

! PARITY STRIPPER FOR CNTL-C TEST

0551	F5	E6
0552	00	7F
0553	00	C3
0554	F1	70
0555	C9	06

! MAIN CHARACTER INPUT ROUTINE

0556	DB	CD
0557	00	1F
0558	E6	C0
0559	01	CA
055A	C2	56
055B	56	05
055C	05	00
055D	DB	00
055E	01	00

! INPUT TEST

060C	DB	CD
060D	00	1F
060E	E6	C0
060F	01	00
0610	CC	CA
0611	6D	51
0612	06	05

PATCH

! INPUT TEST

0668	DB	CD
0669	00	1F
066A	E6	C0
066B	01	C8
066C	C0	00

! CASSETTE INPUT (NOT CONSECUTIVE)

1141	06	FA
1143	01	50
1144	C2	CA
1148	07	FB

! CASSETTE OUTPUT (NOT CONSECUTIVE)

114F	06	FA
1152	C2	CA
1157	07	FB

! CASSETTE INITIALIZATION

1159	06	F7	RST 6
115A	01	00	

! Extended Mods

! DISABLE CONSOLE SWAPPING FUNCTION

3A43	FE	00
3A44	43 (C)	00

! PREVENT TERMINAL SETUP, AND INITIALIZE CUTTER

30EB	DB	3E
30EC	FF	00
30ED	E6	D3
30EE	F0	FA
30EF	0F	C9

! SHORTEN ILLEGAL FUNCTION CALL, AND OUTPUT TO CASSETTE

0349	4C	20
034A	45	46
034B	47	55

Address	Original	Change
034C	41	4E
034D	4C	20
034E	20	43
034F	46	41
0350	55	4C
0351	4E	4C
0352	43	00 (EQM)
J		
0353	54	F5 NULL PATCH
0354	49	AF
0355	4F	D3
0356	4E	FB
0357	20	F1
0358	43	06
0359	41	01
035A	4C	FE
035B	4C	FA
035C	00	C9
J OUTPUT		
0E01	DB	F1
0E02	00	C5
0E03	E6	47
0E04	80	CD
0E05	C2	19
0E06	01	C0
0E07	0E	78
0E08	F1	C1
0E09	D3	B7
0E0A	01	C9
J PATCH FOR CNTL-C TEST		
0E0B	F5	E6 PATCH
0E0C	00	7F
0E0D	00	C3
0E0E	F1	C6
0E0F	C9	0F
J MAIN INPUT ROUTINE		
0E10	DB	CD
0E11	00	1F
0E12	E6	C0
0E13	01	CA
0E14	C2	10
0E15	10	0E
0E16	0E	00
0E17	DB	00
0E18	01	00
J INPUT TEST		
0EAD	DB	CD
0EAE	00	1F
0EAF	E6	C0
0E90	01	00
0EB1	CC	C4
0EB2	C3	0B
0E93	0F	0E
J INPUT TEST		
0FB E	DB	CD
0FB F	00	1F
0FC 0	E6	C0
0FC 1	01	C8
0FC 2	C0	00
J CASSETTE INPUT (NOT CONSECUTIVE)		
F	06	FA
22F 6	01	50
22F 9	C2	CA
22F D	07	FB

Amateur Computing 78—July 22-23

Sheraton National Motor Hotel Arlington, Virginia

CALL FOR PAPERS - This is to invite you to present a paper, participate in a panel discussion, display an amateur computer system or sponsor a tutorial at Amateur Computing 78. This will be a weekend microcomputer festival with attendance of several thousand people interested in personal computing from viewpoints of users and avid hobbyists.

Those interested in making a presentation should submit a letter of intent along with a one-page abstract or outline by April 15 to John Wall Miller, Program Chairman, 6921 Pacific Lane, Annandale, VA 22003, telephone (703) 256-5702. Authors presenting papers will be provided with instructions for preparation of camera-ready papers which are due by June 1. Areas of interest are: personal computing applications of microcomputers; home educational uses of computers; speech, music and graphics; standards for hardware, software and interfacing to the real world; and, subjects of interest to beginners.

Commercial exhibitors will include retail computer stores, computer systems manufacturers, computer services, computer magazines and others. An exhibitor prospectus will be available from Amateur Computing, P.O. Box 682, McLean, VA 22101.

Amateur Computing 78 will be held in the modern, attractive and completely equipped convention facilities of the Sheraton National Motor Hotel which is near the Pentagon and overlooks the monuments of Washington, DC. Out-of-town attendees will want to reserve one of the 336 luxuriously appointed rooms at the hotel. All requests for rooms should be directed to the hotel at (703) 521-1900 (not the toll-free 800 number) mentioning Amateur Computing. Or, write to the hotel at Columbia Pike & Washington Blvd., Arlington, VA 22204.

This event is being sponsored by AMRAD who held the highly successful AMRAD Computerfest in October 1976 in Vienna, Virginia. The 1976 fest in one day attracted over 1500 people. Amateur Computing 78 will be a two-day show in a fine, new hotel.

Homebrew Computer Club.
P.O. Box 626, Mountain View, CA 94042

J CASSETTE OUTPUT (NOT CONSECUTIVE)

2304	06	FA
2307	C2	CA
230C	07	FB

J CALL NULL ADDING ROUTINE

230E	06	CD
230F	01	53
2310	FE	03
2311	F4	00

LETTERS

This letter was inspired by the March 78 issue of SOLUS NEWS. First, I ordered the Vandenberg 16k static RAM board by telephone on 4 January and had it on the 7th. It has been in my SOL and working perfectly ever since.

My computer is built around the SOL PC board. The power supply is home brew, the keyboard surplus, the other memory boards are the ECONORAM II and ECONORAM III. I have the Software Technology "Music System", Percom CI-812 Interface board, Peripheral Vision Floppy, Dutronics Z-80 conversion kit, Teletype Model 43, and the Carterfone (Selectric) Data Terminal.

So far the PV floppy will not work with my SOL. I can read their disk but can't write one. I'm going to send it back to them to see if it is the floppy or my machine. The Dutronics Z-80 kit is also giving me trouble. It works most of the time but gives me CS errors when running BASIC5 for no reason and it will not even read some ROMs but will read others.

The Selectric hasn't been interfaced yet. It is ERCD and RS-232 and I have a program but just haven't gotten around to it yet. This letter was written by SOL on the Model 43 using the "Electric Pencil" by Michael Shrayer. This is a fantastic text editor and it comes on a CUTS cassette with a very good manual. No changes were required to run it. The Model 43 has a TTL interface and the TTL to RS-232 interface converter for \$7.00 from Electronic Systems is all I needed to get it up and flying.

I also had washing machine problems and I installed a surge filter and RF filter but it didn't help. I mounted the PC board and power supply in a metal cabinet and grounded everything and I haven't had any more problems. My computer and my washing machine are on the same 30 Amp breaker. I plan a separate circuit soon.

That's it for now, Stan. I'm still selling articles all over the place. Seventeen since January 1977. Lastly, I think that the Teletype Model 43 is the best printer buy on the market. For \$1950 from the DATA MART in Arlington Heights, Illinois it includes a very nice solid state keyboard. The paper is also much cheaper than the type used on the Axion 800 written up in SOLUS NEWS.

Sincerely,

Rod Hallen

Rod Hallen

P.S. My Processor Technology Extended Cassette BASIC just arrived. A very long wait but it looks like it was worth it. I haven't done much more than load it and play but it has an awful lot of features that I have been waiting for, and some that I didn't expect like program renumbering. I'll pass along my thoughts on it after I work with a while. I wish that all my BASIC5 tapes could be used with it but no go. I'll have to enter all of my programs again by hand. Oh well, I can rewrite and improve them at the same time. Now let's see, what did I get for my \$45.00.

Be advised that I am plugged into the Pascal News, and have even ordered Z-80/8080 Pascal for my company, HPA, from the University of California at San Diego. I'll report when I get it working (it costs \$200/copy).

Sincerely,

Rod Montgomery

Rod Montgomery

THE ENCLOSED CIRCUIT MAY BE WHAT YOU ARE LOOKING FOR IN ORDER TO REMOVE POWER LINE "HASH" IN YOUR SOL.

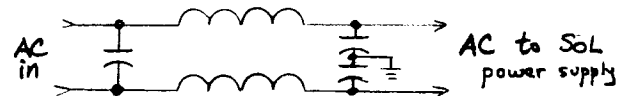
I TOO, HAD TROUBLE WITH POWER LINE GARBAGE (ESPECIALLY WITH MY VIDEO MONITOR, SINCE THAT WAS VISIBLE). THE CIRCUIT SHOWN IS NOT CRITICAL AT ALL, BUT THE VOLTAGE RATINGS OF THE CAPACITORS MUST BE OBSERVED. THE INDUCTORS WERE HOME-MADE, USING 16 GA. WIRE (INSULATED) AND WOUND ON A HALF INCH ROD. THE NICE THING ABOUT THIS CIRCUIT IS THAT IT IS CHEAP. ALSO, NOTE THAT IT'S NOT DESIGNED TO PROTECT AGAINST A NEARBY LIGHTNING STRIKE (AS ARE THE UNITS EQUIPPED WITH G.E. MOV UNITS). RATHER, IT FILTERS THE "HASH" ONLY.

TRY ONE. YOU MAY DO AS I DID AND PUT ONE IN EVERYTHING AROUND---(SOL, VIDEO MONITOR, PRINTER, AND DISK).

SINCERELY,

Bill Jones

WARRION, OHIO



Caps = .02 @ 600v (ceramic)

Coils = 3 feet of #16 ga. wound closely on a 1/2" form.

I HAVE NOTED A SPORADIC PROBLEM IN MY SON'S SOL-20 (AND HAVE HEARD OF THE POSSIBILITY OF SIMILAR PROBLEMS IN OTHER SOLS. IN A DISCUSSION WITH A COMPUTER TECHNICIAN, PHIL, WORKING AT THE SAN RAFAEL BYTE SHOP):

THE SOL-20 BCB (5 SLOT BACK-PLATE-BOARD) IS INSERTED INTO J11, THE 5-100 BUS OF THE SOL PC MOTHERBOARD. WHEN ATTACHING AND TIGHTENING THE GUSSET AND ANGLE BRACKETS (SEE CABINET-CHASSIS ASSEMBLY INSTRUCTIONS IN SOL SYSTEMS MANUAL), SOME BCB PINS MAY LOSE CONTACT WITH THE 5-100 BUS.

THIS PROBLEM SHOWED ITSELF AS A MERE INABILITY TO USE TWO DIFFERENT MEMORY BOARDS SIMULTANEOUSLY, AND WAS CORRECTED BY ENSURING THAT THE BCB WAS PUSHED FIRMLY INTO THE 5-100 BUS.

THANKS FOR THE GOOD WORK ON SOLUS NEWS.

P.S. ENCLOSED IS A FIRST DRAFT OF SOKRAB COUNTY COMPUTER CLUB NEWSLETTER.

Earl Berk
EARL BERK
17 SPRING HILL DRIVE
CABINERO, OH. 43021

Re: Sol & VDM GraphicAdd

Your readers may be interested in a Canadian addition to the support available for Sol and VDM. The attached sheet describes a graphics package that is available from Micro-Ware Ltd. in Toronto (27 Firstbrooke Rd., Toronto, Ont. M4E 2L2).

I purchased the GraphicAdd kit and I am extremely happy with it. The piggyback PC board was easy to assemble and install. Everything worked immediately. The documentation is good, and the graphics driver supplied on CUTS tape is easy to use.

All in all I regard GraphicAdd as a satisfying addition to my system acquired at a very reasonable price.

Yours sincerely,



Arthur L. Close
VANCOUVER B.C.
CANADA

(Editor: We'll have a review of GraphicAdd and another graphic add-on for SOL in a future issue.)

Congratulations on a fine job with SOLUS NEWS up to now; keep up the good work! To help you keep it up, I am enclosing my \$10 membership dues for 1978, as indicated in the October/November issue. Also enclosed with this letter is a brief description of my adventures with relocating cassette ALS8 to a more convenient location in my SOL system. If this information might be useful to other members, please include it in a future issue. Also, any additional information or corrections would be appreciated. (By the way, do all ALS8 tapes contain the same version? Users who attempt the relocation should check my information against their actual code before changing anything.)

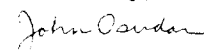
I am happy to see new SOLUS chapters forming, including two in the Chicago area. (Though Lombard, IL is almost as far from Chicago as I am in Homewood!) What is involved in being a local chapter coordinator? I might be interested in coordinating south suburban Chicago members, if there are any, if I knew what that might involve.

Does anyone in SOLUS have a SWTPC PR-40 printer attached to a SOL? If so, are there any difficulties in interfacing? I've been looking at the PR-40 as a possible addition, but need to know what I'm getting into. Also, does anyone have practical information about MECA's Alpha-1 digital tape system used with a SOL?

I just got my Extended Cassette BASIC this week; while it's a little larger than I expected, it seems to be quite good. I hope PT gets on the ball and gets that promised software done and shipped soon (as well as their ACCESS.)

Thank you for taking the time to listen to us far-distant members.

Yours truly,



John Osudar
Homewood, IL

Another SOLUS member asked in a recent (Vol. 9, No. 3) issue of SOLUS NEWS if anyone had modified PT's ALS-8 to be more compatible with SOL. (The person asking was Mr. Bruce Barron).

Well, YES!

The following patches were made to the ALS-8 Cassette tape that I received from P.T. Inclusion of these patches will allow for straight-forward SOL use of ALS-8, without regard to P.T.'s change notice #1B or the "DF80 garbage" referred to by Mr. Barron.

LOCATION	BEFORE:	CHANGE TO:
E1E0	A9	77
E1E1	D0	FE
E1E9	01	FC
E1EF	00	FA
E1F0	E6	1F
E1F1	40	E6
E1F2	C9	01
E1F3	CD	C9

May I make a suggestion? How about including the address of those that write to SOLUS NEWS? This would allow those persons desiring information quicker response from other readers.

Keep up the good work, Stan!



Bill Jones
MARION, OH

(Editor: Thanks for the info and the suggestion, Bill. I will gladly print anyone's address if they explicitly say it's okay to print it. In general my policy is not to print addresses because of two reasons. First, I want to encourage open letters among members rather than a lot of side correspondence so we all can benefit from the information. Second, the Southern California Computer Society has had a bad experience because members' addresses got into the hands of thieves.)

HOW DO YOU LIKE THE NEW FORMAT?

We realize the new format needs a bit more polishing up and would like to know reader reactions to it. Is it too hard to read? Is the print too small? Did you prefer the old format? Is the nuisance a reasonable price to pay for getting twice the information? Let us hear from you. Write to the editor please.

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Micro-Shev Ltd.

מיקרו-שב בע"מ, אלון שבות, גוש עציון, ישראל · Alon Shvut, Gush Etzion, Israel

Jan. 12, 1978

Sol User's Group

Bill Furas
4190 Maybell Way
Palo Alto, CA 94306

Dear Sir:

As the SOL dealer, assembler and technical support in Israel, we have assembled about a dozen SOL's, and have a few hints for others.

- 1) If resetting is a problem, replace U76 = 74LS175 with a 54LS175 (military version). Similar replacements have also been found to help with stubborn CRT driver problems.
- 2) The RS-232 pullup resistor, R29, should be disconnected from the 5v supply and reconnected to 12v (e.g. Q1 emitter).
- 3) The ALS-8 can be modified to work directly with the SOL:


ALS driver

E1E0 A9 D0 CD A4 D0 CA 98 D0 DB 01 E6 7F 47 C9 DE 00
E1F0 E6 C0 C9 CD A4 D0 CA EF D0

revised ALS driver (changes underlined)

E1E0 A9 D0 CD A4 D0 C2 96 D0 DE FC E6 7F 47 C9 DE FA
E1F0 E6 C1 C9 EF CD 54 CC F1 C9

Sincerely,



Dr. Yehuda Carr, Ch. Eng'r

27

By now, you have probably heard that PI inadvertently omitted a means of sending nulls to a printer from Extended Basic. I was told that they had planned to let Solos do it, but, as it turns out, EB does not send the proper message to Solos. For Diablo owners, it means that we have to operate at 300 baud each time we want to use EB; for me that is a pain since 90% of my work is with the Electric Pencil at 1200 baud. It is possible to include a PAUSE in every other statement line, but that does not help if you need to list a program. Has anyone in the club written a software "fix" for this problem?

If you are overwhelmed with SOLUS NEWS, I might be able to help out with some of it.

Regards,


Gerald Harwood

I have an insurance agency, and am using the Sol to type letters, rate policy quotes etc. I felt that if I was going to use a computer to address my customers, I didn't want them to know it. This meant I had to have a solid character printer, but I couldn't get myself sold on a selectric conversion because they are slow and the mechanics remind me of a corn thrashing machine. I wound up with a used GE Terminate, a 30 cps terminal which after 2 months is completely reliable, quiet and compact. Both the Sol and Terminate seem to think that they are talking to another computer through the serial interface, so the Transmitted Data (TA) and received Data (RB) signals must be reversed. Also you must change the request to Send (CA) and Clear to Send (CB) lines.

There has been lots of discussion on tapes. Late one night I needed a tape and was out of the expensive ones. I slipped in a "cheapie", and it worked fine. Now I buy Radio Shack Concertape, three C-30's for \$2.00. My recorder is a Panasonic RC-30VS, with automatic record volume setting, and it makes a really hot tape. I saved enough to buy a Helios.

Finally, can you recommend a text, or was anycopy written software to index disk data files. If and when the Helios and BASIC get together, I will have about 1000 customer files to access with non sequential customers. How can I get to the last file without reading every one in between?

Happy diodes!

Martin Hill, Jr.

Aurora, Colo.

Stan: The best assembly language programming book that I've seen is 8080/8085 assembly language programming by Leventhal - Osborne & Associates.

ROD HALLEN

Tombstone, AZ


```

54
CRAB 00      1290      DF      W
CRAC 04      1300      DF      'T'+RHH FILE TYPE
CRAD          1310 *REMAINDER OF HEADER IS BUILT ELSEWHERE

```

```

ACHT 001C    1060
CLOSE 002F   0930
CR      0000   0690
DISPL 0016   0730 0940 0960 1010
EXCLM 0021   0920
EXIT  0033   0800 1130
FCLOS 000A   1180
FIRST 00F9   0670
FLSTS 0055   0750
FOPEN 0007   1120
GOTCR 00F1   0700
HEADR 0046   1110
NWLNF 0044   0650 0670 0980 1220
OPEN  0020   0770
OPORT 0007   1200
OUT    0004   0880
RTN    00F0   1070 1240
RURRT 007F   0950
SOLOS 0004   1230
TAPE  000F   1030
TAPEF 0045   0710 0740 1050 1210
TOUT   00C0
UNIT   0001   0780 1100 1170
WRPRT 0010   0790

```

```
AS--DUMP CAC0 CRAC
```

```

CAC0: 05 05 05 78 06 7F 47 3A 4A 0F B7 02 F9 0A 78 FF
CAD0: 0D CA F1 CA 3A 45 0F B7 CA 16 0F 32 45 0F 3A 55
CAF0: 08 B7 0C 20 0F 3F 01 0D 10 0A 0A 33 0F 01 01 F1
CAE0: 09 7F 01 32 4A 0F 03 04 0A 78 FF 21 CA 2F 0F 5A
CR00: 16 0F FF 7F 0A 16 0F 21 4A 0F 36 00 FF 30 FA 16
CR10: 0F FF 3A FA 0F CA 4F 32 45 0F 0D 10 0A 03 0D 0A
CR20: 05 3F 01 21 46 0F 0D 07 00 0A 33 0F 01 0F 3F 01
CR30: 0D 0A 00 3F 00 32 07 0F 32 45 0F 32 4A 0F 0A 0A
CR40: 00 03 0D CA 00 00 42 53 43 35 54 00 0A

```

```

* Mods to SOLOS to permit display of underline (5FH)
* Backspace is DEL only (7FH)
* Shift-DEL is underline (_)
* Warning: This change may affect other software
*
* Programmer: Ronald G. Parsons
*

```

```

C1FE          ORG  0C1FEH
C1FE 7F      DB    7FH    BACKS is now 7F only
*
C28B          ORG  0C28BH
C28B 7F      DB    7FH    backspace
*

```

A PATCH TO EXTENDED CASSETTE BASIC TO
PROVIDE NULLS AFTER EACH OUTPUT LINE
By Processor Tech

```

10 REM.
20 REM. CHANGE CRLF ROUTINE IN BASIC TO JUMP
30 REM. TO THE CRLF ROUTINE IN SOLOS/CUTER
40 REM. WHICH WILL OUTPUT A NUMBER OF NULLS
50 REM. EQUAL TO THE NUMBER SET IN SOLOS/CUTER
60 REM.
70 REM. FOR SOLOS AND FOR CUTER LOCATED AT 0C000H
80 REM. THE ADDRESS OF THE MEMORY LOCATION THAT
90 REM. CONTAINS THE NUMBER OF NULLS TO OUTPUT IS
100 REM. 51216 DECIMAL. THE NUMBER OF NULLS OUT-
110 REM. PUT CAN BE CHANGED BY THE COMMAND:
120 REM.
130 REM. POKE 51216,N
140 REM.
150 REM. WHERE N IS THE NUMBER OF NULLS NEEDED
160 REM.
170 FOR N=0 TO 4
180 READ D: POKE 9840+N,D
190 NEXT N
200 REM.
210 REM. FIND OUT WHERE SOLOS/CUTER IS LOCATED
220 REM.
230 LET A=PEEK(9852)*256
240 REM.
250 REM. CALCULATE ADDRESS OF CRLF IN SOLOS/CUTER
260 REM.
270 IF PEEK(A)=0 THEN LET A=49913 ELSE LET A=A+834
280 REM.
290 REM. POKE LOW BYTE OF ADDRESS OF CRLF IN SOLOS/CUTER
300 REM. THEN POKE HIGH BYTE OF ADDRESS
310 REM.
320 POKE 9845,(A/256-INT(A/256))*256
330 POKE 9846,INT(A/256)
340 END
350 REM.
360 REM. THE DATA BELOW IS EQUIVALENT TO:
370 REM.
380 REM. XRA A
390 REM. STA 286FH
400 REM. JMP
410 REM.
420 DATA 175,50,111,40,195
430 REM.

```

The program above was sent to us by the Processor Technology software support people. It corrects the problem mentioned by Gerald Harwood on page 27. Apparently BASIC expected SOLOS/CUTER to supply the null characters necessary to kill time while hard-copy terminals return the carriage to column 1. But BASIC didn't do it right. This patch program will modify BASIC in memory. Save the corrected version of BASIC for future use.

The Atlanta chapter of SOLUS is alive and active. Our first meeting was Friday, January 13 (an auspicious meeting time) with about 10 people present. In the three meetings we've had since then our number has just about doubled (19). We normally meet on the first Monday and the third Thursday of each month, though this is subject to change, and our meeting place varies from time to time, so you'd better announce in SOLUS NEWS for any interested members to contact me first for current information (at (404) 436-0718).

Our first club project will be the establishment of communication capabilities through the use of modems. We are currently testing the modem kit put out by Electronic Systems of Burlingame, CA. If you'd be interested I'm sure we can provide you with a critique of this piece of equipment.

I personally would be interested in corresponding with anyone who has built and successfully implemented the 5204 PROM programmer that was written up in the September issue of Kilobaud.

Is there anything that I can do from afar to help with the software library? I am very interested in this activity and would be happy to help any way that I can. Have you thought about regional distribution of the software?

Keep up the good work. You'll be hearing from me on a fairly regular basis.

Sincerely,

George

George P. Reeves

METROPOLITAN WASHINGTON SOL USERS GROUP FORMS

Several SOL Users from the Metropolitan Washington DC area have been meeting monthly since the Fall of 1977. The first few meetings were "get acquainted" meetings with members of the group explaining certain features of the SOL system (e.g., VDM), demonstrating the EXPANDOR printer with a SOL, and presenting home brew software. In addition to these monthly meetings, the group is also sponsoring a weekly workshop in assembly language programming techniques; the goals of this workshop include the development of a text processor to be used in preparing letters, reports, etc. We expect to get our second projects started in a few weeks; this project will probably use Extended BASIC and develop a family financial accounting system. Anyone in the area interested in participating in any of these activities may contact:

Jim Logan
6817 Melrose Dr.
McLean, VA 22101
703-356-1968

SONOMA COUNTY COMPUTER CLUB NEWSLETTER # 1 MARCH/APRIL 1978

THE SONOMA COUNTY COMPUTER CLUB WELCOMES ANYONE INTERESTED IN PERSONAL COMPUTERS. THE CLUB WILL HOLD ITS NEXT MONTHLY MEETING ON MONDAY, MARCH 27, 1978, AT THE CODDINGTOWN COMMUNITY MEETING ROOM (SECOND FLOOR, NEAR KPIS RADIO). THE MEETING WILL BEGIN AT 7:30 P.M. AND THE GUEST SPEAKER WILL BE **WESLEY A. STONE, CPA**. MR. STONE IS A SANTA ROSA CPA WHO WILL DISCUSS THE MEANING OF ORDINARY AND NECESSARY EXPENSES INCURRED IN A TRADER BUSINESS. HE WILL ALSO DISCUSS HOBBY LOSSES AND EDUCATION EXPENSE.

THE MARCH 27 MEETING WILL ALSO INCLUDE THE DEMONSTRATION OF A PERSONAL COMPUTER SYSTEM BY CLUB MEMBER EARL HERR, USING THE PROCESSOR TECHNOLOGY "SOL-20" COMPUTER AND "HELIUS 11" FLOPPY DISC, WITH A PRACTICAL AUTOMATION IMPACT LINE PRINTER.

THE SONOMA COUNTY COMPUTER CLUB WAS STARTED OVER TWO YEARS AGO BY LIZA LOOP AND MARK ROBINSON, MEETING AT THE LOPOP CENTER IN COTATI. WHEN THE LOPOP CENTER CLOSED, THERE WAS A HALF YEAR LAPSE, UNTIL MEETINGS RESUMED AT THE CODDINGTOWN MEETING ROOM IN JANUARY, 1978. AT THE FEBRUARY 27 MEETING, MARK ROBINSON WAS ELECTED CLUB CHAIRPERSON, AND DAVE & ANNIE FOX PRESENTED AN EXCELLENT EXAMPLE OF COMMUNITY COMPUTER ACCESSIBILITY IN THEIR MARIN COMPUTER CENTER (A BEAUTIFUL AND PRACTICAL CENTER AT 70 SKYVIEW TERRACE, ROOM 301, SAN RAFAEL, 94903; SEE MARIN COMPUTER CLUB ANNOUNCEMENT BELOW).

THE SONOMA COUNTY COMPUTER CLUB WILL HOLD REGULAR MEETINGS AT 7:30 P.M. ON THE LAST MONDAY EVENING OF EACH MONTH, EXCEPT THURSDAY, APRIL 27, AND DECEMBER DATE NOT YET SET.

OTHER BAY AREA MEETINGS:

- MARIN COUNTY COMPUTER CLUB, 1ST WEDNESDAY OF MONTH AT 7:00 PM. AT MARIN COMPUTER CENTER (ABOVE), DIRECTIONS: 415-472-2650. NEXT MEETING APRIL 5.
- HONOLULU COMPUTER CLUB, 2ND WEDNESDAY OF MONTH AT 7:00 PM. AT STANFORD LINEAR ACCELERATOR CENTER, 2070 SAND HILL ROAD, MENLO PARK. CONTACT HONOLULU COMPUTER CLUB, P.O. 628, MOUNTAIN VIEW, CA 94042. NEXT MEETING APRIL 12.

SONOMA COUNTY COMPUTER CLUB NEWSLETTER INFORMATION, CALL EARL HERR AT 707-632-5425.

Extensys was not able to demonstrate their SOL-compatible products at the March meeting of the S.F. Peninsula chapter. They plan to do it at the April 16 meeting. Consult the last issue for the time and place.

34 AXIOM PRINTER DRIVER FOR BASIC

By Bruce Barron

Processor Technology's long-awaited Extended Basic has finally made it out. This is an excellent Basic and has built in functions to use the SOLOS pseudo-ports.

I have an Exim EX-800 printer which requires a short output driver to handle timing and to provide EPT output in parallel with the printer. It seemed like a waste of time to hard load this driver each time I loaded the Basic so I modified the Basic as shown.

This program can easily be modified to also preload an input driver and custom programs. To use, load the original Basic but do NOT execute it. Now load the the given program modified with your own driver. Then store the entire program on tape and use this tape for all further work. Once the program is initiated the Basic is identical to PTC's original.

Warning: Resetting via UpperCase/DEL also resets Co,ci,co

```

0000          0010 * LOADER FOR PTC EXTENDED BASIC BY B BARRON
0000          0015 * THIS PROGRAM MODIFIES EXTENDED BASIC TO LOAD
0000          0020 * AN OUTPUT DRIVER INTO MEMORY STARTING AT
0000          0025 * LOCATION 0000H, 1FH BYTES LONG, THE DRIVER
0000          0030 * ORIGINALLY RESIDES AT 3FB0H.
0000          0035      ORG      0
0000 C3 86 3F  0040      JMP      3F86H
0000          0045      ORG      3F86H
3F86 E5        0050      PUSH   H
3F87 11 02 00  0055      LXI    D,0002H
3F88 19        0060      DAD    D
3F88          0065 * THIS IS THE SAME AS "SET ON"
3F88 36 00     0070      MVI    M,ADDL
3F88 23        0075      INX    H
3F8E 36 0F     0080      MVI    M,ADDH
3F90          0085 * * * * *

```

```

3F90 21 00 0E  0090      LXI    H,NEW
3F90 01 00 3F  0095      LXI    B,000F
3F96 16 1F     0100      MVI    D,LEN
3F96          0105 * MOVE DRIVER
3F98 0A        0110      NEXT  LOAD  B
3F99 77        0115      MOV   M,A
3F9A 23        0120      INX   H
3F9B 03        0125      INX   B
3F9C 15        0130      DCR   D
3F9D 02 98 3F  0135      JNZ   NEXT
3FA0          0140 * THIS REPLACES ORIGINAL VALUES IN
3FA0          0145 * LOCATIONS 0001 AND 0002, THIS IS
3FA0          0150 * NECESSARY SINCE THE INITIALIZATION
3FA0          0155 * RUNS A CHECKSUM ON EVERYTHING.
3FA0 21 01 00  0160      LXI    H,0001
3FA3 36 20     0165      MVI    M,20H
3FA5 23        0170      INX   H
3FA6 36 3C     0175      MVI    M,3CH
3FA8          0180 * * * * *
3FA8 E1        0185      POP   H
3FA9 01 00 00  0190      LXI    B,0000
3FAC 05        0195      PUSH  B
3FAD 09        0200      RET
3FAE          0205 ADDL  EQU   00      LOW BYTE FOR "CO"
3FAE          0210 ADDH  EQU   000H  HIGH BYTE FOR "CO"
3FAE          0215 NEW   EQU   0000H  FINAL LOCATION FOR DRIVER
3FAE          0220 OPTG  EQU   3FB0H  LOCATION OF DRIVER IN THIS PROG
AM
3FAE          0225 LEN   EQU   1FH   LENGTH OF DRIVER
3FAE          0230 * 3F80  START OF 1F BYTE LONG OPTVER
ADDH  000B  0000
ADDL  0000  0070
LEN   001F  0100
NEW   0000  0090
NEXT  3F30  0135
ORIG  3F30  0095

```

Processor Technology's extended Basic is finally here. During the 13 months since I ordered it I have written numerous programs in various other Basic's I have had in my 501-20 (including MERA 0k, PTC BasicR, and very heavily modified MITS 0k and MITS Extended).

Since PTC's has several very useful additions I wanted to make this my primary Basic and convert all programs into it. For example using the APPEND function I can make existing programs subroutines of other programs without retyping the whole thing.

I have a bit of memory: 20k starting at 0 and another 12k starting at D000. What I did was to enter the old Basic, modify the output driver and then list the program with the ASCII listing writing into high memory. The 12k is enough for almost any program (Both Star Trek and Blackjack each use about 10k). Then I enter the new Basic with a modified input driver to read from memory. If you don't have enough memory a similar method can be used incorporating the WRITE BYTE and READ BYTE tape modes.

The following programs assume that SOLOS is located at C000 and that ram C000-C01F and C000-C001 are available.

Write procedure:

1. Load old Basic
2. Load Write program
3. Exec old Basic
4. GET (CLOAD) first program to be transcribed
5. Return to SOLOS (via Upper Case/DEL if necessary)
6. SET CO C000, SET O=3
7. EXEC 0,LIST,Return to SOLOS
8. A= ASCII listing of the program is now in high memory
9. Dump: C000-C001 This is the top end of the program
10. SAVE D000-(C001 C001)
11. Entr C000: 00 D0 /
12. Repeat from step 3. entire all programs are on tape

Read Procedure:

1. Load Extended Basic
2. Load Read program
3. GE first program from tape be sure to note end address
4. ENTR C000: 10 D0 / This skips the word LIST
5. ENTR End Addr: 42 2E 00 00 00 / This will return to SOLOS at the end of the listing.
6. EXEC 0
7. SET IF=3 Program will now list itself then return to SOLOS
8. EXEC 0
9. Modify the program as necessary and ERPE
10. Repeat from 3. as necessary

This whole process is not as bad as it sounds and sure beats retyping and debugging FORTRAN programs.

Some of the areas that require modification are:

1. PTC does not support 2 letter variables
2. Formatting is different
3. PTC does not have a 0 element in an array
4. String manipulation is different and string arrays are not permitted.
5. PTC will not take a negative number to an integral power or SQR (0)
6. RND will usually require a 0 argument while MITS wants a positive not zero number
7. INPUT statements require a comma after a string not a ;
8. In print statements commas or semicolons must be used before and after strings.

It may sound like a hassle but I have found that it is worth the trouble.

38 WRITE PROGRAM

```

C000: F5 E5 D5 C5 2A 00 CB 70 E0 22 00 CB 3E 00 CD 10
      00 C1 01 E1 F1 C9 /
C800: 00 00 /

```

READ PROGRAM

```

C000: E5 2A 00 CB 23 7E E6 7F B7 CA 04 0A FE 00 CA 04
      CA 22 00 CB E1 C9 /
C800: 10 DA /

```

As for the question raised by Larry Lenzath about TREK-88 I offer the following:

LOCATION (hex)	WAF	TS
0076	00	20
0030	00	00
0046	00	00

For reference the subroutine in question starts at 0020.

This was worked out in about 15 minutes using:

DEBUG 8080 by Bay Area TimeShare, Inc

This is a real time Debug aid, assembler and disassembler which I very highly recommend to everyone but especially software hackers.

Computers and the Stock Market

This letter is to computer hobbyists who are interested in (or have experience) speculating in the Stock or Commodities Markets. If you are interested in the markets and computers, it's only natural to combine the two hobbies in an attempt to maximize profits, or more important, to minimize losses. It also seems that an information exchange program among a small group of dedicated people seeking speculative profits would offer several financial advantages to the members of the group.

What I propose is a nationwide club with a

monthly or bi-monthly newsletter that allows members to benefit from the combined talents, techniques and experiences of the group.

The newsletter would be generated by the inputs of the members. I foresee, as a minimum, the following types of services or technical articles that would be included in the letter:

TECHNICAL ARTICLES: The use of moving averages; The application of successful systems with home computers; Basic articles on the markets (How to get started in commodities with \$2,000, The Dow Jones Industrial Averages, Trading in Warrants, Options and other forms of speculation).

PROGRAMMING: How to program: HIGH-

```

10 PRINT TAB(20); "SIMULTANEOUS EQUATIONS"
20 PRINT "WRITTEN BY PRIME BARON FEB. 14, 1978"
30 PRINT "This program solves N independent linear simultaneous"
40 PRINT "equations in N unknowns. The equations should be of"
50 PRINT "the form:"
60 PRINT "  A(1,1)*X(1)+A(1,2)*X(2)+.....+A(1,N)*X(N)=B(1)"
70 PRINT "  A(2,1)*X(1)+A(2,2)*X(2)+.....+A(2,N)*X(N)=B(2)"
80 PRINT "  ....."
90 PRINT "  ....."
100 PRINT "  A(N,1)*X(1)+A(N,2)*X(2)+.....+A(N,N)*X(N)=B(N)"
110 INPUT "NUMBER OF EQUATIONS "; N
120 DIM A(N,N),X(N,1),B(N,1),A1(N,N)
130 FOR I=1 TO N
140   FOR J=1 TO N
150     PRINT "INPUT A";I;";";J;":"";"
160     INPUT A(I,J)
170   NEXT
180   PRINT "INPUT B";I;":"";"
190   INPUT B(I,1)
200 NEXT
210 MAT A1=INV(A)
220 MAT X=A1*B
230 FOR I=1 TO N
240   PRINT "X";I;":"";"X(I,1)
250 NEXT

```

This program shows the power of PTC's Extended BASIC matrix statements. Bruce plans to send us an electronic circuit frequency response analysis based on it.

39

Computers and the Stock Market

This letter is to computer hobbyists who are interested in (or have experience) speculating in the Stock or Commodities Markets. If you are interested in the markets and computers, it's only natural to combine the two hobbies in an attempt to maximize profits, or more important, to minimize losses. It also seems that an information exchange program among a small group of dedicated people seeking speculative profits would offer several financial advantages to the members of the group.

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TECHNICAL ARTICLES: The use of moving averages; The application of successful systems with home computers; Basic articles on the markets (How to get started in commodities with \$2,000, The Dow Jones Industrial Averages, Trading in Warrants, Options and other forms of speculation).

PROGRAMMING: How to program: HIGH-

LOW-CLOSE data and retrieval, Moving Averages, Momentum indexes, Advance/Decline lines or any other technical indicators.

ADVERTISING: Offerings of books, programs, systems or equipment for sale, loan or swap.

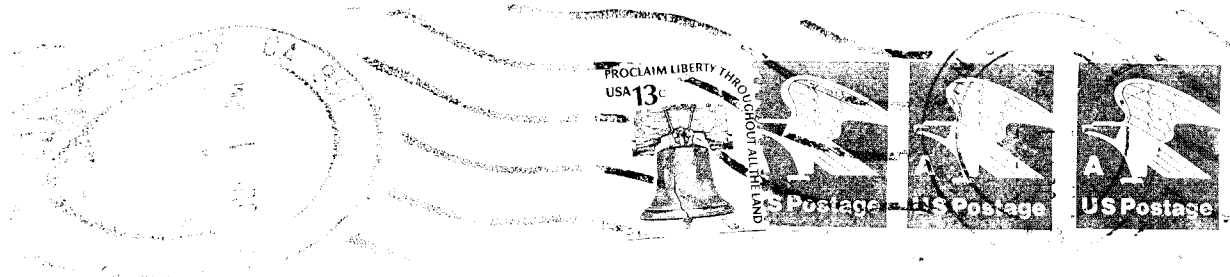
If making more money in the markets with computers interests you, write to me and let me know how you feel about a club as I have described.

Richard T. Vannoy, LT, USN.
COMSUBRON SIXTEEN
c/o FLEET POST OFFICE
New York, New York 09501

Commodities — Interested contacting computer oriented individuals who are working on commodity trading systems. I've developed 3 - contact Jack Adison, 60 East 42nd Street, Suite 739, New York, NY 10017, (212) 434-7843.

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ADDRESS NEWSLETTER CORRESPONDENCE TO THE EDITOR. SEND ALL OTHER CORRESPONDENCE TO THE SOL USERS' SOCIETY, P.O. Box 23471, SAN JOSE, CALIFORNIA 95153. SUBSCRIPTIONS ARE AVAILABLE THROUGH MEMBERSHIP IN SOLUS. INDIVIDUAL DUES ARE \$10 (U.S. CURRENCY) IN USA, CANADA, AND MEXICO; \$15 ELSEWHERE. DEALER MEMBERSHIPS (\$25) AND MANUFACTURER MEMBERSHIPS (\$50) ALSO INCLUDE EXTRA SERVICES. MEMBERSHIPS EXPIRE AT THE END OF EACH CALENDAR YEAR. NEW MEMBERS WILL RECEIVE BACK ISSUES FOR CURRENT YEAR.

SOLUS SOFTWARE LIBRARY TO MAKE FIRST TAPES

Our latest "David" to take on the "Goliath" task of producing a library of public-domain programs has collected almost enough programs in three dialects of BASIC to fill one C-60 cassette. He also has about 2/3 of a cassette of music for the Software Technology music system and is beginning a third volume on assembly language programs. If you have any public-domain programs to contribute, please contact the Solus Librarian thru our P.O. Box. To obtain a copy of the library tapes at cost, a member will have to submit a new program, so early contributors will be the first to qualify. Our librarian will get permission for the programs' sources before distributing programs copied from magazines or books, so be sure to give the full reference if you were not the author of 100% of the program.

WHEN YOU WRITE TO SOLUS NEWS

To make life simpler for us here at Solus News, we have changed the format of our newsletter (beginning with the last issue) so that we can reprint the letters and articles we receive, essentially as-is. When you write to us, please type your letters within a 6 1/4 inch column (65 characters at 10 per inch). We will cut and paste the letter to fit our layout page. Two of these pages are laid side by side and photo-reduced to become the printed page you see. The camera doesn't see light blue, so be sure to use a dark ribbon. Corrections can be made invisibly with opaque correction fluid ("liquid paper"). Thanks for helping to share the load.

CLASSIFIED ADS

After several requests, we have begun a classified ad section in this issue. The ad space is free to Solus members for ads of a non-profit nature, which includes the resale of equipment you no longer want. Ads for a business pursuit and ads from non-members will require payment of \$1.50 per line. Send your ad typed exactly as it is to appear, since we will process the ad like any other submission to Solus News. Payment must accompany the camera-ready copy, if payment is required. Confine your typing to a 6 1/2 inch line, and limit your free ads to 5 lines or less.

HELIOS/PTDOS WORKSHOP WILL BE TOPIC OF SEPTEMBER S.F. BAY MEETING

Processor Technology Corporation will present a workshop on their floppy disk system at the September 17 meeting of the San Francisco Peninsula chapter of SOLUS. They will have a Sol+ Helios system on hand to demonstrate new business software and their new graphics accessory. In addition they will discuss topics of interest to Helios owners, including questions on the PTDOS system. Send us your suggestions for topics you would like covered. For example, are there any features of PTDOS you want explained better than the Helios manual does? Everyone is welcome, so invite a friend. Members outside of the area can send us suggestions and read about the resulting discussion in Solus News.

HELIUM FOR HELIOS USERS

Helium, the Helios users' organization formed by PTC, has begun operation. It is organized by Ian Kettleborough, who has authored some of PTC's software. PTC has announced that Helium will be the official outlet for software correction updates to their disk-based software, so membership in Helium will be essential for maintaining your system. To join, write to: HELIUM, c/o Ian Kettleborough, P.O. Box 9269, College Station, TX 77840.

SOLUS will continue to offer articles and other support to the Sol users who have Helios systems, because we feel that a truly independent and unified users group is in the best interest of the users, PTC, and other manufacturers. We offered our help to Helium and suggested that some sort of joint effort would be best for everyone, but to date we have received no reply.

IF YOU MUST CALL PTC...

Nothing irks me more than wasting a long distance call. If you're like me, you will be glad to know that Processor Technology has established office hours when their technicians will be available to answer technical questions by phone. If you can't get the answer to your question from your nearby dealer of PTC equipment, PTC will help during these hours only:
Monday through Friday, 9 - 12 am -- Helios and software only
" " " " 1 - 4 pm -- Sol and other hardware (CUTS, 3P+S, 16KRA, etc.)

A MICROCOMPUTER CONSTRUCTION COURSE

BY

Paul Sadler and Jack Crandall

MARINER I, the student built computer at Sehome High School, Bellingham, WA is a Processor Technology SOL-20 micro-computer utilizing an 8080A processor chip. Twenty-seven students, selected by two instructors, built the computer from a kit this fall quarter as part of a "Computer Design and Construction" class. The students ranged in math ability from Practical Mathematics through Calculus and in age from freshman to senior. The selection criteria was motivation, ability in electronics, and achievement in Computer Science courses. Two instructors were required by the necessity for attention to detail, need for expertise in electronics, and knowledge in the computer science field. Jack Crandall teaches Physics and has developed an intensive digital electronics course. Paul Sadler teaches a computer literacy course and computer programming courses in a variety of languages.

The Computer Design and Construction Class met M,W,F for 2 hours after the regular school day to eliminate conflicts with other elective courses. Our immediate objectives were to teach electronics, construction techniques, and soldering skills. Students worked in groups of 3 to learn the theory of operation and construct an 8 transistor radio kit. Soldering skills were perfected during this first phase and the quality of the finished computer and lack of construction errors proved this time was well spent.

Phase 2 contained three concurrent sessions; 1. digital electronics utilizing a circuit designer, 2. actual construction of the computer components, and 3. machine language (hexidecimal) programming. The three groups rotated each 2 weeks to allow all students to build a portion of the computer. All construction work took place in teams of 3 students. One student would read the instructions, a second student did the soldering, and a third student would inspect the results. This team work and double checking prevented any construction errors. The only problem was an error in the construction manual by the manufacturer. After several frustrating days a long distance phone call to the factory corrected the situation.

2

The computer was operational 2 weeks before the end of the quarter and the remainder of the time was spent writing machine language programs in hexidecimal code. Additionally, a music system board was purchased and several of the musically oriented students programmed songs to include the school Alma Mater.

The Computer Design and Construction Class was a big success with the entire faculty and student body taking pride in our accomplishments. Our plans are to have as many students as possible use the computer and to DO IT AGAIN next year!

--Jack invites requests for information about the project. Please address correspondence to him at Sehome Computer Club, 2700 College Park Way, Bellingham, Washington 95225

"GRAPHIC ADD" FOR SOL AND VDM

By Howard Johnson and Steve Johnson

Being "spoiled" users of full graphics on a Tektronix 4010/PDP-10, we've had more than a passing interest in implimenting high-res graphics on our Sol. Well aware of the typical costs and memory burdens of such capabilities and having heard favorable comments about the \$50 GraphicAdd, we eagerly placed an order for one of these with our friendly local computer store in December. It finally arrived in early April, and we had it running two days later! Since neither of us could be classed as experienced electronics types, that in itself speaks well for the product.

Construction is easy and rapid - a liesurely evening project. The PC board is of excellent quality and clearly marked. Soldered components include four capacitors, two(or three) resistors, and seven DIP sockets in addition to twenty three terminal pins that allow the board to plug into the Sol (or VDM). Installing these pins properly is undoubtedly the most difficult part of construction; the method of alignment recommended by KEA works quite well, however. In general, the instructions supplied with the kit were quite adequate - complete with PC layout and schematic.

Installation of the device is somewhat more troublesome because the safest way to impliment the necessary mods to the Sol PC board is to jumper wire on the solder side and this requires disassembly of the Sol. We used the #1 and #2-2 options (3 jumpers and a trace cut) that allow programmable graphics enable (as opposed to fixed graphics or switch-selectable enable). Mod #1 is necessary for all options as it provides access to data bit 8 of the video display memory. After these mods, there was no apparent effect on the normal operation of the Sol with GraphicAdd installed or removed. Again, the supplied instructions (with alternate instructions for the Proc. Tech. VDM board) were entirely adequate - complete with Sol PC (and VDM) mod diagrams and modified schematics.

GraphicAdd comes with five IC's; the two additional IC's come from the Sol and plug into the remaining two DIP sockets. The "piggy back" board then plugs into the two DIP sockets on the Sol PC left vacant by the two-chip transfer. On the Sol PC this plug in area is comprised of the sockets labeled U41 and U25 (under the front left of the keyboard). To prevent the keyboard from exerting undo pressure on the "piggy back" board, we used the recommended standoffs (2 washers under each mounting screw) to elevate the keyboard slightly. This worked fine, but we would prefer something like two fiber plates with properly placed holes and a sticky backing. This would allow more convenient future removal and re-installation of the keyboard as well as providing better support (manipulating 8 fiber washers in addition to 4 lock washers is clumsy to say the least).

GraphicAdd provides a modest, but very useful, expansion of the capabilities of the character generation portion of the VDM display section. It functions by replacing a portion of the inverse video ASCII character set by bit-mapped graphic cells. In effect, it provides a 6-fold increase in graphics resolution (128HX48V) since the normal 9 by 13 dot pattern is divided into six independent portions. Vertically, each character matrix is divided in half and horizontally the 13 dot column is divided 4,5,4. Thus "minicursors" are made up of either a 4 X 5 or 5 X 5 dot pattern. The resulting 20% difference in cell heights depending upon scan location was not significantly noticeable in our judgement.

Only a limited amount of software came with our kit; however, this gave a good general indication of the capabilities. The graphics driver routine (provided on cassette) loads in the Sol scratchpad RAM (CB00H). It allows simultaneous display of graphics and normal ASCII characters. We were able to use this driver rather easily in North Star Basic via the machine language subroutine CALL funtion which passes the address and position to the D and E registers. Thus we were able to impliment "Spiral" (provided as a program listing for BASIC 5) in North Star Basic and save it and the graphics driver on diskette.

The graphics version of "Life" (also provided on cassette) is a very interesting variation and provides the ability to easily "draw" patterns with the higher resolution. A BASIC 5 graphics implimentation, including its own copy of the graphics driver, is provided on cassette. It resides at the end of BASIC 5 and adds a .75K extension with self-patching. A cassette program called EXONE demonstrates graph plotting capabilities. In general, diagonals and curves are plotted rather neatly as solid lines --- though obviously "stepping" remains prominent at this resolution (whadaya expect for 50 bucks?!).

All in all, we were quite pleased with GraphicAdd and would recommend it as a worthwhile and rather impressive accessory for expansion of Sol/VDM graphics capabilities at very modest price with a minimum amount of effort and with minimal memory requirements. Reportedly, software patches for more convenient use of the system with North Star Disk Basic and Processor Tech. Extended Cassette Basic are under development.

GraphicAdd is a product of KEA Micro Design, Toronto, Ontario, Canada. It is supplied as a kit consisting of a 3½ by 3 inch PC board and all necessary components with a 29 page manual and a cassette tape. It is intended for the Sol and other systems using the Processor Technology VDM board and 8K or more of memory.

PTC NEW PRODUCT SHIPPING DATES

As of their May 25 newsletter to their dealers, PTC has made the following release schedule:

You want it when?!

NEW PRODUCT UPDATES

<u>Item</u>	<u>Begin Shipping</u>	<u>Change</u>
<u>Hardware</u>		
HyType II	shipment has begun	
HyType I	week of May 26	On schedule
<u>Software</u>		
8080 FOCAL	week of May 29	On schedule
Software #1, Resident 8080 Assembler	week of June 19	
Extended Disk FORTRAN	week of June 19	
Cassette PILOT	week of June 19	
EDIT, Advanced 8080 Editor	week of June 26	



TROUBLES IN CUTS AND SOL LAND

OR IMPROVING CASSETTE RELIABILITY

BY JOE GAUTHIER

4

All audio cassette decks used for digital work suffer from a case of phase shift. The severity of the problem varies considerably, but is especially severe in the Processor Technology's CUTS system. This comes about from the use of a 600 Hz tone for the space condition.

The low frequency response of the typical mediocre quality cassette deck causes severe phase shift, which has the effect of smearing the data signal. The effect is analogous to an old telegraph phenomenon known as fortuitous distortion.

This phase shift may be corrected by a lead network, which is incorporated in both CUTS and SOL. However, the phase correction introduced by the lead network is inadequate, as there is a lack of 600 Hz level. A Wein Bridge filter installed between the cassette deck and the computer input jack corrects the problem.

Figure 1 shows the relevant waveforms. Observation of waveforms A and B on a dual-trace scope are most interesting. The output of the recorder is placed on the A trace, and the output of the lead network (R7 in CUTS, R40 in SOL) is placed on the B trace. Sync to the B trace.

The output of the cassette will be jittery, with very unstable zero crossings. The output of the lead network will be very stable. The important thing is that the instantaneous zero crossing rate of change will exceed the speed change limits of the system.

Both CUTS and SOL have a design error in the transition detector. The transition detector pulses are extremely narrow, and cause clock recovery problems. Relocating C22 in CUTS (C49 in SOL) from pins 2 and 3 of the Exclusive OR to pins 1 and 2 will stretch the transition outputs from a measured 100 nS or so to 20 uS, resulting in very solid clock recovery.

The Wein Bridge filter must be tuned to your recorder, and this needs a scope. The waveform at the output of the lead network should have two equal peaks, and these may be balanced by adjusting R1 and R2 of the bridge.

Not all recorders have very bad low frequency phase shift. HI-FI decks will record and playback an almost perfect square wave. Any deck with a monitor jack that bypasses the output stage will probably work without any filter or lead network.

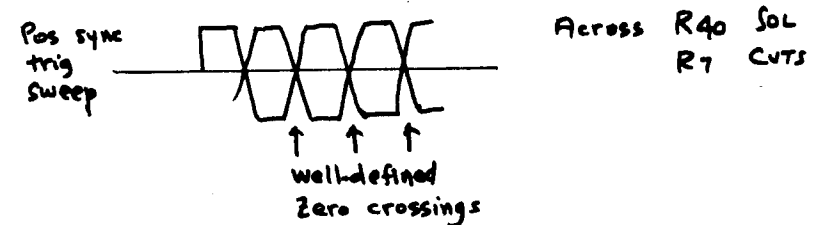
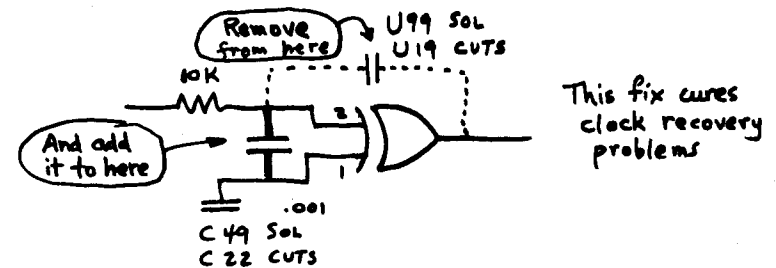
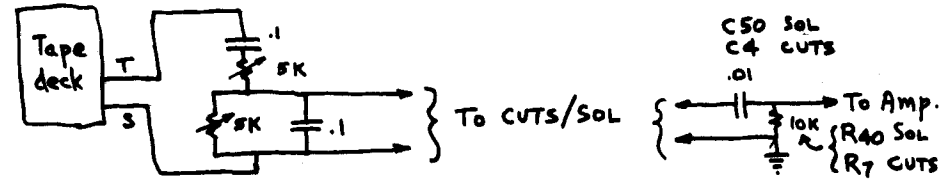
In some cases, tapes recorded by the user will exhibit different waveforms than mass produced, and different equalization will be required. A scope tells all.

Another problem that is quite prevalent is that of head alignment. The head should be aligned with an alignment tape, such as TDK. A quite acceptable substitution is any commercially duplicated tape by AMPEX, GRT, etc. Adjust the head for best high frequency response. Remember that data density on the tape is about 1 mil/bit, and a very small error can cream data.

A lot of noise has been made regarding the required frequency response characteristics of analog data systems. If telegraph technology is applied, the HF response must be 3x the baud rate, and the LF response must be 1/3 the baud rate. Thus CUTS and SOL need a deck with a flat response from 400 Hz to 3600 Hz to recover the third harmonic, and to prevent unstable zero crossings.

GAUTHIER'S FIGURE 1,

This fix cures jitter (zero crossing) problems:



TARBELL DISK INTERFACE MODS

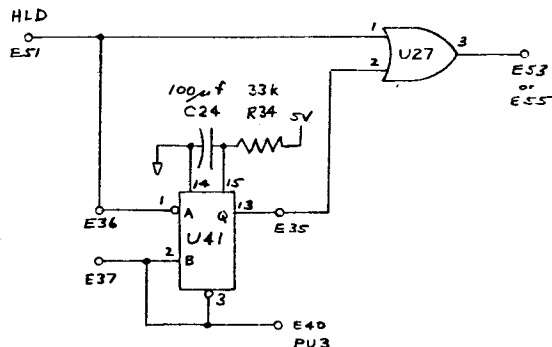
By Ron Parsons

The Tarbell Floppy Disk Interface has been described in these pages before. The interface is an S-100 board containing a 1771 LSI disk formatter/controller chip for full-size soft sectored diskettes. It is commonly used as a controller for the disk operating system CP/M from Digital Research. In the standard form of the interface, the 1771 controls the loading of the head against the surface of the diskette. Once the head is loaded, it remains loaded until the third index pulse following the last operation which used the read/write head. For full-size disks, this is about one-half second. At that time, the head is unloaded from the diskette. It is quite common for another disk command to almost immediately follow the unloading of the head causing the head load relays to go clack-clack-clack.

The following modification to the board greatly reduces the number of times the head loads and unloads but keeps the head unloaded during periods of inactivity so wear on the disk head and diskette surface is minimized. The head load signal (HLD) goes to jumper point E51 on the Tarbell board. E51 is normally jumpered to E53 (or E55) which drives gates to control the disk unit. The Tarbell board also contains an undedicated one-shot timer U-41 pins 1-3 and 13-15. The PC board also contains positions for the RC network, R34 and C24, to control the timing. This one-shot is connected between E51 and E53 (or E55) so that the head remains loaded for a period of time after the 1771 releases the head. In my case, a time period of one second seemed optimum. The head remains loaded during assemblies, loads, etc.

The mods to the board are shown in the figure and described below. An unused OR gate, U27 pins 1-3, is used to OR the head load signal HLD with the output of the one-shot. On the solder side of the board, connect jumpers from U41-13 (E35) to U27-2, from E51 to U27-1, and from U27-3 to either E53 or E55 as required for your disk. Install a jumper from E37 to E40 so the clear and B input to the one-shot are high. Install another jumper from E51 to E36 so the A input of the one-shot is triggered when HLD falls. Install R34 and C24 for the RC network. I used values of 33k and 100uf to give a one second time period. It may be necessary to cut the trace which leaves U41-14 on the solder side of the board as not all 74LS123s work with pin 14 (Cext) grounded.

With this mod, your disks will perform more quietly and may require less maintenance.



THE DYTRON 32K STATIC MEMORY BOARD

By Ron Parsons

Another 32K static S-100 memory board has come on the scene. I discovered it through a small notice in the April 3rd issue of Electronic Engineering Times. The announcement said the board had been tested in all major S-100 systems, used TMS-4044 chips with access times of 300 ns, required 8V only at 400 ma for each 4K and was priced at \$705 in quantities of 1 to 10. Not having heard of Dytron, Inc. before, I called them and talked to John DuBois. John was very informative and helpful and gave me the names of several stores who had used the board. I received only glowing reports on the board and Dytron so I ordered one of their boards. To my surprise, nine days after I sent them my order, UPS delivered it to me. I immediately plugged it into my Sol and ran memory tests and the Helios disk test for several hours. All tests were perfect. The four heat sinks on the right side of the board were hardly warm to the touch (my buss voltage is 7.6 volts and I have added a fan to the back panel on the Sol).

The board is configured as eight independent 4K segments and can be purchased loaded with 8, 16, 24 and 32K of chips. It comes assembled, tested, and burned-in on a very clean looking solder masked P.C. board. All the address and data lines are buffered with LS TTL devices on the address lines and 74367s on the data input and output lines. Low profile sockets are provided on all ICs. Any 4K block can be addressed on any 4K boundary or disabled completely. The addressing provision uses a 24 pin socket on the lower left corner of the board. An empty header is provided for soldered address jumpers or solid #22 or #24 jumper wires may be inserted directly into the socket. Eight of the positions on the socket correspond to the eight 4K segments while the remaining sixteen positions correspond to the sixteen 4K pages in the 64K address space. No provision is made for memory bank selection. If a 4k bank is not jumpered it is effectively out of the system and that address is available for other memory boards or memory mapped I/O. A jumper provision for "Phantom" is included but not needed by the Sol.

The board came with TMS-4044-30 memory chips giving an access time of 300 ns. The board draws about 3 amps fully populated. This turned out to be the same as the two 8K boards it replaced (a PTC 8KRA and a Godbout Econoram II). The Sol runs noticeably cooler with the 32K board than it did with the two 8K boards even though the total current load is the same (?). Dytron states that the buss supply voltage must be at least 7 volts DC and should not exceed 9 volts unless forced air ventilation is provided. I ran the board with the extra fan off and the regulators got quite warm (but not excessively so).

Dytron, Inc. is located at 241 Crescent Street, Waltham, Mass. 02154, telephone (617)891-9029. The company is eight years old and is primarily in the industrial process control equipment business. They got into microprocessors first for in-house users and later for parts of control systems. They also have an I/O control board available which was described in the proceedings of last years West Coast Computer Faire on page 325, "A real time tracking system for amateur radio satellite communication antennas" (OSCAR).

I would give the Dytron board a very high recommendation. It has worked well with both the Helios II DMA disk controller and the Tarbell disk controller.

THE MICROBYTE 32K STATIC RAM BOARD

BY STAN SOKOLOV

6

EXTENSYS BREAKS THE HELIOS BARRIER

BY STAN SOKOLOV

Here's yet another 32K board using the TMS 4044 static RAM chip. Although I'm only in the market for 16K more ram now, I decided it makes sense to get a 32K board populated with 16K. That way I can easily expand later with out taking up another slot. This particular board was discovered in a Byte magazine ad by JADE COMPUTER PRODUCTS, 5351 West 144th Street, Lawndale, CA 90260.

The Microbyte board sounds quite similar to the Dytron board Ron Parson's describes in this issue, except that the Microbyte has two extra address bits to allow bank selection and nine-count-'em-nine regulators.

Don Smith at Jade told me that the big problem with most 32K static boards is heat dissipation. They're trying to overcome the problem by distributing the load over 9 regulators on a very large heat sink which runs the full length of the board. This may help keep each regulator cooler than in boards with fewer regulators, especially in systems where the "+8v" supply is too high (common in Sol's). The same amount of heat will be created as in boards with fewer regulators, but it will hopefully dissipate better. That's the theory, but in my system where I've lowered the +8v supply to just under +8v with diodes, the extra regulators don't seem to make any difference. Using my high-technology thermal measuring device (my thumb to be exact), I can't tell the difference between the operating temperature of the Microbyte's regulators and those of the Artec 32K static board, which uses TMS 4044 chips and only 4 regulators. So the difference may only be important in overvoltage situations.

Another feature of the board is its use of very wide power and ground traces to act a bus bars. These, I'm told, help minimize noise on the board.

The two extra address lines are implemented thru jumpers to the S-100 bus pins adjacent to the Phantom pin 67. That is, A16=pin 68 and A17=pin 69. With the jumpers out, the board acts like an ordinary non-bank selected board. Other jumpers allow selection of the bank within 256K address space in banks of 64K each. Phantom is also optional with a jumper. By comparison, the Artec board has the Cromemco-style bank selection using an I/O port to enable the bank and jumpers on the board to select the bank address to which the board responds. This is a more complex type of bank selection than the Microbyte, but it doesn't require memory management hardware to put the signals on the bus. This may account for some of the price difference between the two boards.

The board is laid out so that each column of 8 chips corresponds to a 4K address block. Prefabricated jumpers are provided to select the address to which each column responds, using a dip socket. The documentation illustrates the chip layout and jumper installation.

As with the Dytron board, the so-called 450 ns board actually is supplied with 300 ns chips. That's not quite fast enough for 4 MHz Z-80 systems, but fast enough for Sol. A 250 ns chip option is available.

The board runs warm, but not as warm as some of the chips on the Helios controller. I don't have an extra fan on my Sol, but I have punched 3 one-inch-diameter holes in the back cover, farthest from the existing fan. This helps a lot with airflow thru the card cage in the Sol. I borrowed the punch from an electrician.

The Microbyte 32K static board appears to be a quality product. It comes fully assembled, with sockets for all IC's. It sells for \$775 plus tax and shipping. The 250 ns version is \$850. I've tested it with Helios and found it reliable. It has my recommendation.

On May 22, a technician from Extensys Corporation brought the latest version of their 64K dynamic Ram board to my computer for testing on my Helios. As you may know, the Helios controller in a Sol has been murder on dynamic memory boards that weren't designed with it in mind. The timing of the dynamic board's hidden refresh often conflicts with the DMA timing of the Helios. Processor Tech's dynamic boards are designed to coordinate with the Helios, but other manufacturers haven't been so fortunate.

Extensys has redesigned their 64k board to overcome many speed and timing and noise problems they previously encountered in the various S-100 systems on the market. The board I saw was a production version labeled "Extensys RM-650 250 ns Serial 11262." We first tried it in the Sol without the Helios controller on the bus. Everything seemed to work except that Solos would occasionally give a question mark response to a valid command. Realizing that the full 64K board overlaps with the Sol's internal RAM and ROM space, the technician disabled the C000+D000 block of the Extensys board. Then the system became reliable. The Sol is supposed to ignore the S-100 bus when addressing the internal memory, but in this case something didn't work quite right.

Next we ran a routine from cassette, which worked as it should. We then installed the Helios controller boards, loaded the disk test program from cassette, and ran the test. Although we didn't have time for an extensive run, we did let the automatic test go for 100 full iterations, which it did without error. Finally we booted PTDOS and ran a few programs, again without error. So it looks like this version of the board can handle Helios.

The 64K dynamic board has the advantages of slot conservation and low power consumption. Both of these features are important in Sol, where heat dissipation and slot scarcity are problems. Moreover, it runs at 250 ns, which provides a hedge against obsolescence when the time comes to trade the Sol for a system which can use the extra speed. Power consumption is about 1 amp for 64K.

On the negative side is the extra complication of a dynamic memory board. My engineering friends are down on dynamics in general. They feel that they are hard to get to work the first time in a new system configuration, hard to maintain, and in general not worth the risk of future incompatibility. Static memories are much more tolerant in these regards. Consider the problem you might have if the manufacturer of your board went out of business and you couldn't find anyone to maintain it for you.

After weighing the pros and cons, if you decide to get a dynamic, be sure to get the guarantee that you'll get your money back if it won't work in your particular system. And be prepared to do the same each time you add a new component to your system.

1. **Expandable Memory:** The RM650 memory board comes in three sizes: 32K, 48K & 64K. The 32K and 48K versions are fully socketed with monolithic bypass capacitors for expansion to 64K by simply adding memory chips. We provide burned-in and tested memory chips as "Upgrade Kits" (8K & 16K).
2. **More Reliability:** All of the address and control lines are doubly filtered...once by R/C networks and again with Schmitt inverters. Data lines also contain Schmitt circuitry to reduce noise sensitivity. The R/C networks attenuate high frequency noise spikes and the Schmitt gates provide twice the noise immunity of TTL gates to guard against false triggering.
3. **Multi-layer Construction:** The RM650 contains separate power and ground planes for added noise rejection and protection of signal integrity.
4. **Extra Fast Memory Chips:** The RM650 uses Intel 2109 chips at 200ns. It provides Z-80 speed compatibility as well as an extra margin of safety for 8080 & 8085 systems to guard against bit-dropping from propagation delays and signal skewing on bus lines.
5. **Co-existing Addresses:** It is easy to have ROMs & the RM650 RAM co-exist in overlapping address spaces. The board contains an INH line that inhibits READ and WRITE inputs, tri-states the outputs, and maintains refresh. This feature makes the RM650 exceptionally easy to use with ROMs, memory-mapped monitors and operating systems where conflicting addresses would otherwise be a problem.
6. **More than 64K:** Even though 8-bit microprocessors can only address 64K, it is very easy to add more than 64K to a system. Realistically, up to one megabyte in 8K increments! What's needed is a simple memory manager board, an 'I/O' port software routine and a memory board with programmable bank-switching capability. The RM650 incorporates this bank-switching feature...and as many as sixteen RM650 boards can be installed in the same system.
7. **Compatibility:** The RM650 is compatible with many S-100 systems. We publish a list to assure end-users of technical compatibility. See attached list.

CPU - MAINFRAME

Altair
 Byt-8
 Cromemco 'Z-2
 Equinox 100
 Extensys EX-3000
 IMSAI (8080 & 8085 types)
 Polymorphic (Note 2)
 Processor Technology SOL (Note 4)
 Vector Graphic 8080

DISK UNITS

Altair
 Cromemco Z-2D
 Digital Systems with 1.4
 Interface Card
 Extensys FOS1000
 Helios
 ICOM
 Info 2000
 Micromation
 Micropolis
 North Star
 Tarbel

TAPE UNITS

Cuts
 Micro Designs
 Polymorphic MECA
 Tarbel

NOTE #1 - Parasitic Engineering has made available to owners of the Equinox 100 computer an upgrade kit incorporating several modifications - one of which is necessary for the operation of the Extensys RM650. Currently delivered machines already incorporate the modifications.

NOTE #2 - SMI & PWAIT must be available on the bus to enable proper refresh of the RM650. PHLDA must be disabled on the RM650. (Documentation available on request from Polymorphic or Extensys.)

NOTE #3 - "Cycle-Stealing" DMA device represent a departure from the typical S-100 bus operation. We do not recommend the use of the RM650 boards for systems with cycle-stealing.

NOTE #4 - ALS-8 Compatibility: To insure proper operation of ALS-8 on SOL-20, connect U53-10 on the SOL Board to Pin 59 of the S-100 bus. This modification utilizes the RM650 'inhibit' signal to eliminate any bus contention between the SOL video RAM space and Extensys RM650 RAM between addresses C000 and CFFF. Using the inhibit line rather than the bank select switch allows use of address space D000-DFFF by the ALS-8 operating system.

THE TARBELL FLOPPY DISK INTERFACE

BY JAY BELL

8

REPRINTED FROM:
PRINT-OUT Journal of the Central Texas Computer Association

The TARBELL Floppy Disk Interface, Tarbell Electronics 20620 South Leapwood Ave., Suite P, Carson, CA 90746 Kit \$190, Assembled \$265.

Finally. It has arrived -- floppies for the masses. Don Tarbell has created a board using standard components and what has become the standard LSI disk controller chip, the Western Digital 1771 (second-sourced by National). That in itself is not particularly noteworthy, since others have used the chip to drive their favorite disk drive. What Tarbell gives you is the ability to drive YOUR favorite disk drive. No longer need you buy a complete system from someone who has packaged it in an expensive box, with an expensive controller that can only be bought with their particular set-up at their particularly set-up price.

Tarbell takes the 1771 chip and interfaces it with the Altair bus on one side, and sticks all the necessary logic and high-powered drivers on the other side and lets you jumper the signals to the appropriate pins of a 3M-type connector for direct connection to almost any disk drive. Let's face it, there are certain signals that all drives need, such as head load, drive select, write enable, data in and out, etc. What seems to be most different among all the drives is the particular pin-out on the connector. So Tarbell lets you determine the pin-out and some of the permutations of the above signals to drive just about anything. The instruction manual is extensive, mostly well-written, and even gives all of the proper jumper connections for such drives as the CDC BR803A, the Persci 270, Shugart 800, Innovex 210/220 and 410, and the GSI 110. It's not difficult to

look at the jumpers for these drives and figure out the differences for some drive you may come up with. I interfaced the board to the pair of CalComp 140s that were originally hooked up to the infamous IMSAI controller. I also connected it to the Pertec FD400s as configured by Altair. Both worked the first time.

The hardware test procedures and debugging steps are extremely detailed and will be appreciated by those with meager hardware experience. However, those with an organized, logical mind will wonder what fit of lunacy Tarbell must have been in when he numbered the 50-some jumper points. They are just everywhere! And beware of the silk screen. Finding the correct resistor pads is often a matter of finding the largest hole. And there are two E23 jumper pads on the silk screened legend. Check the manual to find out which one is really E33.

While Tarbell doesn't sell systems as such, he does supply his dealers with some of the standard drives so that they can configure a system for you. What you would normally want to get is the bare bones operation -- the drive, a power supply, the controller board and cables. You can probably put all this into some metalware if you can afford the going price for aluminum these days -- about \$100 - \$150 for a disk sized box. Or, if you're like me, you can junk a dud controller and step up the performance of your existing system with a reliable single board.

From a hardware (and software) standpoint the 1771 does all the work. For those of you not familiar with the chip, it is essentially a microprocessor dedicated to the control of a disk drive. As such, you can program it with certain

instructions to accomplish a physical task. For example, you can tell it to seek track 33, and it does all the stepping of the head motor, loading of the head, and verification of the fact that this is indeed track 33. When it has so positioned the head, it lets you know, and you give it its next task, such as writing a sector or whatever. Note that you don't have to write the software that counts tracks, steps the head, waits for the head to settle after loading, etc., etc. So, the chip takes a big software burden off you (as well as about 60 TTL gates worth of head steppers, and latches, and on gates and off gates and re gates):

The chip is most often used as an IBM-compatible, soft-sectored controller with all of the esoterica pertaining thereto (26 sectors per track of 128 bytes per sector and 77 tracks). But, it allows you to set the sector length and format under software control so you can do your own thing (such as controlling mini-floppies, which are not IBM compatible diskettes). We'll delve into the mini-floppies and the Tarbell board in a bit.

The controller board comes with a bootstrap ROM that can be enabled on power-up or on reset to boot in the first sector of an IBM-type diskette. The 32-byte ROM is cleverly set up as phantom ROM that takes up no address space in your computer. When the ROM is activated, the processor reads from ROM starting at address 0, but directs memory writes to RAM. This ROM is really intended to boot CP/M, a very comprehensive disk operating system by Digital Research. What is significant about the ROM is that you can easily boot in a sector with only 32 bytes! Try that with most of the other controllers on the market -- it shows how easy it is to use the 1771.

Well, it seems as if everything is good about the Tarbell board. But you and I know that microprocessors were designed with the sole intention of totally frustrating the user. So here comes the bad news about the Tarbell board. It doesn't work with dynamic

memory. A more correct way to state the problem is that dynamic memories don't work with the Tarbell controller. After all, it is the memory's responsibility to remember how to remember data! Most dynamic memory cards seem to get bored during WAIT states, and decide to drop a few bits for fun. You see, the Tarbell controller uses a nifty hardware trick so that the processor can synchronize itself with the data that is coming in from the disk at a rate of 250,000 bits per second. With a CPU like the 8080 and even the Z-80 it is none too easy to plant a byte of data in memory every 32 microseconds with a programmed ready-busy loop and a 2 MHz clock. Tarbell uses the PRDY line to stall the CPU until the next data byte from the disk arrives, or the controller completes execution of the current command. Normally the PRDY line is used to put the CPU into a WAIT state for slow memory (usually about a microsecond or so). The program does an INPUT instruction for a particular port which causes PRDY to be asserted. The CPU does not complete execution of this input instruction until PRDY is released. The CPU monitors the state of PRDY every 500 nanoseconds. The fastest 8080 program can only monitor the "ready" status of the controller about every 19 microseconds. In essence, the microcode of the 8080 is doing the ready-busy loop for you. And all it costs you is one instruction. It's a great trick. It's been used by others (North Star, et. al.) with good success.

The unfortunate consequence of using the PRDY line is that the controller is generating long WAIT states at precise 32 microsecond intervals. That happens to be close to the refresh frequency of most dynamic memory boards. And it plays hell with dynamic memory that doesn't expect such long wait states. They either neglect to refresh memory at all, or give the CPU a couple of microseconds and then take matters into their own hands and start refreshing. Those particular refreshes are not occurring during the "transparent" part of a machine cycle, and when the Tarbell board lets go of the

PRDY line the CPU boogies on to the next instruction, which better not be in the dynamic memory that happens to be doing its "non-transparent" refresh. Either way, it's blow-up city. Mini-floppy controllers that use this PRDY trick don't have this problem with dynamic memory because their WAIT states are so long (about 50 microseconds) that the memory has time to complete its refresh before the input instruction completes.

Extensys boards can't cut it, Dynabyte blows it, S.D. Sales drops the bits, and then there's MITS ... Ron Parsons, on the other hand, has connected his Tarbell board in a novel multiplexed fashion with his Helios II disk system and it works fine with the P. Tech 16K dynamic board.

My standard solution is to use Bill Godbout static memory, period. It works with anything, anywhere, anytime.

One last hardware note: users without a front panel should pull-up the External Clear line (pin 54) to 5 volts so that noise doesn't reset the disk select latch.

The Tarbell documentation states that the board is solely for use with standard-sized floppies, and not mini-floppies. Well, since he uses a 4 MHz clock on board and divides it by two for the large floppies, it seems reasonable to expect a 2 MHz clock to work with the mini-floppies. What Tarbell really means is that Tarbell Electronics does not support the use of the board with mini-floppies. And really, he can't. That's because he has apparently sold the rights to use his board with mini-floppies to a company called VISTA. You've probably seen their ads the last couple of months. They sell mini-floppy systems with their VOS software. Look closely at their ad -- yup, it's the Tarbell controller. That also explains why there is this big ugly black mark on the PC board that covers up some etched printing that says "Vista" with lots of little numbers next to it.

All in all, this is about the bestest and mostest controller board on the market for the price. It gets a three-and-a-half star rating. All dynamic memories that don't work with it get zip. *** */2

THE MATROX... (CONTINUED FROM THE PAGE TO THE RIGHT)

be prohibitive for a hobbyist, but for commercial TV guys who are used to shelling out \$5000+ for a 10 line by 24 char character generator, it's nothing.

Readers of PRINT-OUT have seen some of the images produced by the ALT 256 in the November and December issues. For the quality conscious graphics freak, this board will be well worth the money. There is, however, one slight unadvertised hitch. Since Matrox is in Canada, when you get your board there will be about a \$34 import duty to be paid. That's almost 10% for Governmental protectionism. It rates a three star seal. ***

REPRINTED FROM:
PRINT-OUT Journal of the Central Texas Computer Association

MATROX ALT 256**2 graphics board for the Altair bus, Matrox Electronic Systems, P.O. Box 56, Ahuntsic Stn., Montreal, Quebec H3L 3N5, Canada. Assembled only \$395 + \$35 import duty.

This board comes fully assembled and tested from Matrox and is about the easiest board on the market to drive for high resolution (256 X 256) graphics. The user simply outputs an X component to one port, and a Y value to another port. Output to a third port will either turn the pixel off or on, depending on the value output from the CPU. A "1" turns the dot on. A fourth port on the board allows the user to set the screen to a white or black background.

Within about a minute or two of unpacking the board you can have it displaying whatever your heart desires (depending on how much software you can write in that time). Good graphics software is not the most trivial thing to write. Many of you saw the article by SubLogic in KILOBAUD a few months ago. They have written programs to display in 3-D, and the ALT 256 is the perfect match for this software.

Matrox takes care of all the details in their hardware design. They give you a variety of TV sync options. You can go with the so-called American standard 240 line non-interlaced scan with a horizontal frequency of 15.7 KHZ. Then there is the "modified" American standard that gives you the full 256 lines of display with a 16.8 KHZ scan frequency. This scan rate is used on several commercial terminals to get more chars on the screen. Or, if you suddenly move to Europe, you can use the 50 HZ vertical frequency option.

When the pixels are turned on, there is no visible flicker, since they wait for the 11 microsecond

horizontal retrace period before they access the screen memory. This makes the build-up of the image really impressive. It doesn't slow the speed of building the display either. The limiting factor on the display speed is the rate at which you can output data to the screen I/O ports with Accumulator-locked I/O instructions. A Z-80 won't help you much here either, since you have to alternate ports for X and Y values and setting the pixel on. The Z-80's speedy block I/O only works on one port at a time. Matrox might want to think about having one port alternate between loading the X and Y registers automatically. That would possibly help the Z-80 possibilities. The ALT 256 will display pixels at a theoretical rate of one every 63 microseconds.

By using the I/O instruction method of displaying the image, Matrox is able to use a 65K X 1 dynamic RAM that does not reside in the CPUs address space. That makes the card very universal, but it also keeps you from "reading" the screen's memory in figuring out how to modify the display. It looks as if you could do some modification to permit this with input instructions if that feature is important to you.

The Matrox boys did their homework in designing this board, because they took into account the last 25 years worth of video technology in the commercial TV business. That is almost unheard-of for computer-oriented video designers. With this board you may use external sync from the "house" so that computer images may be added to existing TV programs through a switcher. Computer-aided graphics in instructional television will get its first low-cost boost with this product. In addition, you may gang several boards together to produce images in color (a red screen, blue screen, green screen and two or three for grey scale). The cost may

(CONTINUED ON PAGE TO THE LEFT)

THE ELECTRIC PENCIL
SOLUS SOFTWARE REVIEW

10

by

Z. A. Tea

Product: The Electric Pencil

Price: \$100 (version SS, for Sol with Teletype or Selectric)

This useful program seems somewhat overpriced in today's marketplace, when compared to other software products, such as CP/M, which are priced similarly.

The Electric Pencil, written and marketed by Michael Shrayner, is a word processing program. It allows an operator to enter text into a computer system without worrying about format. Formatting is controlled later, at the time of printout, with a variety of commands. The computer must have an output printer in order to use The Electric Pencil effectively, and upper and lower case will be necessary for almost all users.

The original version of The Electric Pencil is marketed in several versions, depending on what type of printer and what type of cassette interface (and whether or not you have a North Star diskette system) is to be used. This review specifically references the Sol with Selectric or TTY version.

The Electric Pencil is very useful, especially for mediocre typists, because text can be rapidly entered into a buffer in the computer memory without concern for carriage returns or typing errors. Text can then be edited, using a variety of commands to move the cursor, insert and delete lines and characters, and search for and replace character strings.

When the user desires to print out the buffer contents, he can select from a variety of format controls, which allow him to choose the line length, the page length, whether or not to justify the right margin, etc. If the first printout does not satisfy him, he can change the format and print out the buffer again, until the result is as desired. The buffer contents can be saved and reloaded using the Sol cassette interface.

Unfortunately, a Selectric typewriter does not look like an ASCII printer, such as a teletypewriter. At best, if the Selectric has an external ASCII code conversion and control interface, the function of carriage return cannot be separated from an automatic line feed, although some Selectrics allow a line feed (index) without a carriage return.

If, however, the code conversion and control functions are done by software residing in the Sol or other main computer, there should be a specification (not provided) of what the printer driver program can and cannot do with the ASCII data to be printed. In The Electric Pencil, the assumption is made that the ASCII character code for each character printed will be in the 8080 accumulator upon return from the print subroutine. This is nowhere clearly stated in the manual as a requirement.

Since a Selectric typewriter cannot do a carriage return without an inherent line feed, underlining as described in the manual does not work. This is a serious limitation of The Electric Pencil for Selectric owners.

Another problem is that if I/O drivers are needed (such as the aforementioned Selectric driver program), they cannot be placed in memory contiguous with that occupied by The Electric Pencil because it will size and initialize memory and destroy the driver in the process. A provision such as provided by Altair Basic to enter a smaller memory size would solve this problem.

Other problems which have been encountered:

The print function assumes that one is using roll or fanfeed paper. There is no provision for automatically stopping at the end of each page and allowing the user to insert a new sheet of paper (which seems the obvious way a text processor would be used for multi-page letters or reports).

The scrolling operation takes quite a long time. This can cause one or more characters to be lost if the keyboard operator is a fast typist, as is this reviewer. The use of a repeat function on cursor up and cursor down keys causes the cursor not to be visible during periods when the screen image is scrolling.

Other features which one might reasonably expect at this price, but which are lacking include:

1. Provision for automatic centering of lines.
2. Provision to allow embedded control functions so printout could switch back and forth from justified to not justified.
3. Provision for allowing required spaces and other characters.
4. Provision for allowing justified indented paragraphs (indented on both margins).

We strongly recommend to prospective purchasers that, if at all possible, they try this program out at their local dealer's in the exact hardware configuration (especially the printer) they plan to use. Give some thought ahead of time to the functions you need to do your particular job. You may find, despite all the drawbacks we have found, that The Electric Pencil is just the program you need.

NEW TEXT FORMATTER FOR CP/M

REPRINTED FROM CP/M NEWSLETTER #4

Digital Research is pleased to announce that the TEX Text Formatter is available for shipment on June 1 at a cost of \$75 for the TEX diskette and manual (\$10 manual only, \$70 diskette only). This newsletter was prepared using TEX, as was the SID Symbolic Instruction Debugger manual. TEX provides powerful text formatting capabilities using ED (the CP/M context editor) and a printer device. There is complete control over vertical and horizontal spacing, left and right margin justification, and pagination with optional heading and automatic page numbering. TEX provides commands to paragraph, center, literal copy, and multiple space. The TEX manual includes a description of how to use CP/M oriented towards the novice user, with explanations of the editor, pip and command processor to facilitate the use of TEX by non-computer oriented personnel.

BASIC BUGS

BY RON CARDINALE

Processor Technology has some strange and unfortunate bugs in both BASIC 5 and EXTENDED CASSETTE BASIC.

BASIC 5 will sometimes give the wrong answer to arithmetic problems in direct execution. Here is an example:

```
P..0007522*43.47826,1.73E-5/.023/.023
```

The answers displayed will be:

```
.03270435      .000865
```

The answer to the first part is correct but the answer to the second part is wrong. When this problem is solved in a program both answers are correct.

```
10 P..0007522*43.47826,1.73E-5/.023/.023
```

RUN this and the answers will be:

```
.03270435      .03270321
```

Both are correct. The correct answers always result if this problem is solved as a program.

Extended Basic has some problems that are more serious. It doesn't always know what to do with numbers in scientific notation because it always inserts a space. This problem results whether direct mode or a program is used. Here's an example:

```
X=1E22
```

```
P.X
```

```
1E+ 22
```

```
X$=STR(X)
```

```
P.X$
```

```
1E+ 22
```

```
X=VAL(X$)
```

IN ERROR (or TY ERROR) will result. This makes it impossible to simply read scientific notation numbers from files, although they can be written to files without any problems. The only way to get around this that I know of is to read the number as a string and put the string through a function to search for and remove the space, since it is the space that causes this error. This problem also shows up with scientific numbers as a response to an INPUT statement in either direct mode or in a program:

```
IN.X?1E+ 22
```

```
INPUT ERROR, RETYPE?1E 22
```

```
INPUT ERROR, RETYPE?
```

A space anywhere, with or without the "+" will cause this error (Basic 5 has never caused any problems for me when dealing with scientific notation.)

The POS(0) function will sometimes return the wrong number (consider the following program:

```
10 P."BK";
20 IN.,(1,0)""",X
30 POKE 52287+POS(0),65
40 G.20
```

RUN this program and the expected result would be this (you type the "0" and the program puts the "A" on the display):

```
00000000000000000000000000000000 etc.
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA etc.
```

But this won't happen. The result will be this:

```
00000000000000000000000000000000 etc.
A A A A A A A A A A A A A A A A A A A A A A etc.
```

The way Extended Basic handles Long Lines is not too good. A long line stops the listing or edit and won't even display the line on the line number. It will let a long line be made instead of immediately giving an error message as Basic 5 does.

I don't understand why Extended Basic uses some different abbreviations than Basic 5. This gets to be a little frustrating sometimes. I would also like to know why different error messages are used. My favorite error message in Extended Basic is "BS ERROR" which stands for "BAD SYNTAX ERROR". Does anybody know what a GOOD SYNTAX ERROR is??(!) There are five error messages that are not in the manual of Extended Basic: IN, NI, UD, NC, and FP. What most of these mean is usually understandable but just what some of them are supposed to stand for is a little obscure (at least to me!).

Using all 64 columns on the video display without double line feeds is a challenge. Here's a program:

```
10 F.N=1 to 128
20 P."X";
30 N.
```

RUN and the result would be this (or so you might think):

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

But the result will really be this:

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XX
```

The problem is that the line length is initially set to 63. SET LL=64 and this will happen:

XX

XX

There will be a blank line in the middle. When Basic gets to the 64th column it generates a carriage return/line feed.....but so does the video display. I can (almost) understand why this is done but the (presumed) reasoning is somewhat invalid. At any rate, it would be nice if it were possible to SET LL=0 to allow Basic to ignore line length. Does anybody know how to do this or how to eliminate the "RETURN" when the line length is reached without causing other problems? The only way I know around this is to SET LL=65 then when the 64th column is reached P."&M"; (Basic 5 doesn't suffer from this problem). Unfortunately, POS(0) can't always be relied on to return the correct column number.

Both Basic 5 and Extended Basic can do a couple of things that I have not seen in any of the documentation. They will recognize the "TAB" character provided it is preceded by an "ESCAPE" and followed by another ASCII character. For example:

10 P."&C&IFHello"

When this program is run, "Hello" will be printed starting with column number 6 (the 7th column, actually, because the columns start with 0).

Also, both Basics can easily print a quotation mark, something which is either a nuisance or impossible in other basics. This program will print a quotation mark:

10 P."&b"

At the New Jersey Computer Faire in Atlantic City last August, I attended a session in which a debugging program called DDS (Dynamic Debugging System) was demonstrated. I was quite impressed with its capabilities and decided to buy it. This sort of program should be of interest to anyone who has struggled to get an obstinate program to work on a SOL with no front panel and no single step capability. DDS has these capabilities and much more; it is a WINDOW into the 8080 computer system.

Before describing some of its capabilities, I will describe my experiences loading it. The program is available in several versions for SOL/VDM, POLY 88, and for ADM terminals with cursor control. The SOL version comes on a CUTS tape at 1200 baud for \$30.00 and is the first and only program for the SOL which is completely RELOCATABLE at load time. A very short bootstrap routine (26 bytes) must be keyed in which specifies the load address and address of the tape read routine. I had the program loaded and running at the upper end of my RAM in half an hour. I have since relocated it a couple of times. This relocatable feature is an excellent one which I would like to see in all good software.

But what does the program do? DDS allows continuous monitor and control of a target program and continuously displays all register contents, user selected memory contents and contents of the stack as well as the instructions being executed. The program uses the memory mapped display features of the SOL to very effectively display the results of instruction execution as it happens right before your eyes> The upper half of the screen displays a return address stack, the entire stack, the contents of all the 8080 registers and the contents of memory locations pointed to by the register data, and the next six instructions to be executed in 8080 Mnemonics. Yes, it has a built in disassembler. As each instruction is executed in single step mode, the instructions move up as the program counter increments and all registers and memory contents are updated on the screen. The lower half of the screen is used to display either 6 lines of 16 bytes of memory in HEX with ASCII on the right or optionally, instruction mnemonics can be displayed. The memory display is very flexible in that each of the six lines can be a different portion of memory. In addition, the number of steps to be executed with each step command can be specified for rapid stepping through program loops. Some of the commands which are fully explained in the user's manual are: FILL, FIND, MOVE, GO, ENTER BYTE, ENTER CHARACTERS, BREAKPOINT, ADDRESS STOP, VALUE STOP, OP CODE STOP, STACK RANGE, CLEAR SCREEN, ENTER WORDS, ENTER REGISTER, ENTER REGISTER PAIR, POP, PUSH, RETURN, and others.

DDS controls the target program by inserting an RST 7 instruction after the current instruction being executed and saving the byte being replaced (breakpoint technique). Thus, the RST 7 location (0038H) is used by DDS to place a vector to its breakpoint service routine. This can be a problem in some programs and may have to be patched around while debugging. In addition, if the program being debugged expects keyboard input or outputs to the display, the breakpoint facility must be used in order to avoid conflict with DDS operation.

In summary, DDS is a very worthwhile program tool for debugging assembly language programs and is also a very good way to learn how an 8080 works. I have used it as a teaching aid in a microprocessor class with good success. It has been a great timesaver in debugging and modifying several programs on the SOL. The program is well worth the \$30.00 which it costs and is available from Computer Mart of New Jersey, 501 route 27, Iselin, N.J., 08830.

STATEMENT TRACE ROUTINE FOR EXTENDED CASSETTE BASIC

BY JOHN OSUDAR, HOMEWOOD, IL

TRACE is a statement trace routine for Extended Cassette BASIC. It is designed to be used with SOLOS/CUTER; as listed below, it is assembled into the user area of SOLOS/CUTER system memory. Once EC BASIC is initialized, and TRACE is in memory, BASIC must be patched by executing the commands: POKE 1420,180 and POKE 1421,202 which insert B4 CA (hex) at 58C and 58D.

Now, the trace may be turned on by: POKE 52027,1 and turned off by: POKE 52027,0

Note: SOUT (defined in line 1, referenced in line 74 at CB29 hex) is set to C098, which is a SOLOS output routine that allows inverse video output. For CUTER, this should be set to COBB, and for generality (but without inverse video) this can be set to C019. Assembled by ALS8, TRACE source without comments is 1496 (decimal) bytes long; the generated code is 145 bytes plus 10 bytes storage.

C098	0001	SOUT	EQU	0C098H	SOLOS output routine addr
0597	0002	BAKIN	EQU	597H	Reentry addr for EC BASIC
2E51	0003	LNPTN	EQU	2E51H	Current statement ptr addr
2E57	0004	START	EQU	2E57H	Start-of-program ptr addr
CAB4 F5	0005	TRACE	PUSH	PSW	Save BASIC A, flags
CAB5 3A 3B CB	0006		LDA	TFLG	Get trace flag
CAB8 B7	0007		ORA	A	Test it
CAB9 CA 37 CB	0008		JZ	REENT	If trace off, reenter
CABC C5	0009		PUSH	B	Save BASIC's other regs
CABD D5	0010		PUSH	D	
CABE E5	0011		PUSH	H	
CABF 21 49 CB	0012		LXI	H,BUFER	Initialize buffer ptr
CAC2 22 47 CB	0013		SHLD	BUFPT	
CAC5 21 3C CB	0014		LXI	H,PWR10	Initialize powers ptr
CAC8 22 45 CB	0015		SHLD	PWRPT	
CACB 2A 51 2E	0016		LHLD	LNPTN	Get current statement addr
CACE EB	0017		XCHG		Put it into DE
CACF 2A 57 2E	0018		LHLD	START	Get program start addr
CAD2 E5	0019	LOOP	PUSH	H	Save in case it's the one
CAD3 4E	0020		MOV	C,M	Get length of line into BC
CAD4 06 00	0021		MVI	B,0	
CAD6 09	0022		DAD	B	Add to get next line's addr
CAD7 7B	0023		MOV	A,E	Compare (DE) with (HL)
CAD8 95	0024		SUB	L	to see if current statement
CAD9 7A	0025		MOV	A,D	is in this line
CADA 9C	0026		SBB	H	If it is, carry will be set
CADB DA E2 CA	0027		JC	FOUND	Jump if correct line found
CADE C1	0028		POP	B	Discard stacked address
CADF C3 D2 CA	0029		JMP	LOOP	and keep looking
CAE2 E1	0030	FOUND	POP	H	Restore line's start addr
CAE3 23	0031		INX	H	Point to line number
CAE4 5E	0032		MOV	E,M	Move line number into DE
CAE5 23	0033		INX	H	
CAE6 56	0034		MOV	D,M	
CAE7 2A 45 CB	0035	OLOOP	LHLD	PWRPT	Get ptr to -powers of 10
CAEA 4E	0036		MOV	C,M	Get power for converting
CAEB 23	0037		INX	H	next digit of line number
CAEC 46	0038		MOV	B,M	into BC
CAED 23	0039		INX	H	Increment to point to next

CAEE 22 45 CB	0040		SHLD	PWRPT	power, and save ptr
CAF1 79	0041		MOV	A,C	Get low-order byte
CAF2 B7	0042		ORA	A	Test for zero terminator
CAF3 CA 1A CB	0043		JZ	DONE	If zero, no more powers
CAF6 AF	0044		XRA	A	Clear for digit counter
CAF7 EB	0045		XCHG		Easier than JMP ILOOP+1
CAF8 EB	0046	ILOOP	XCHG		Move number into DE
CAF9 60	0047		MOV	H,B	Get negative power into
CAFA 69	0048		MOV	L,C	HL for subtraction
CAFB 3C	0049		INR	A	Increment current digit
CAFC 19	0050		DAD	D	Get number-power of 10
CAFDA DA F8 CA	0051		JC	ILOOP	Loop until "negative"
CB00 2A 47 CB	0052		LHLD	BUFPT	Get buffer ptr
CB03 3D	0053		DCR	A	Take off extra one, test
CB04 C2 10 CB	0054		JNZ	FUTIN	If nonzero, put into buffer
CB07 E5	0055		PUSH	H	Save pointer before test
CB08 01 B6 34	0056		LXI	B,-BUFFER-1	Get value for leading 0 test
CB0B 09	0057		DAD	B	See if lead 0 insertion
CB0C E1	0058		POP	H	Restore pointer
CB0D D2 E7 CA	0059		JNC	OLOOP	If lead 0, don't insert
CB10 C6 B0	0060	PUTIN	ADI	'0'+80H	Form inverse video digit
CB12 77	0061		MOV	M,A	Put it into buffer
CB13 23	0062		INX	H	Increment buffer ptr
CB14 22 47 CB	0063		SHLD	BUFPT	Save buffer ptr
CB17 C3 E7 CA	0064		JMP	OLOOP	Loop for other digits
CB1A 2A 47 CB	0065	DONE	LHLD	BUFPT	Get buffer ptr
CB1D 7B	0066		MOV	A,E	Get value of ones digit
CB1E C6 B0	0067		ADI	'0'+80H	Form inverse video digit
CB20 77	0068		MOV	M,A	Put it into buffer
CB21 23	0069		INX	H	Increment buffer ptr
CB22 36 AF	0070		MVI	M,'/'+80H	Put in separator/end marker
CB24 21 49 CB	0071		LXI	H,BUFER	Get buffer start addr
CB27 46	0072	FLOOP	MOV	B,M	Get a character for output
CB28 E5	0073		PUSH	H	Save buffer ptr before call
CB29 CD 98 C0	0074		CALL	SOUT	Output one character
CB2C E1	0075		POP	H	Restore buffer ptr
CB2D 7E	0076		MOV	A,M	Get character again
CB2E 23	0077		INX	H	Increment buffer ptr
CB2F FE AF	0078		CPI	'/'+80H	Test character for end mark
CB31 C2 27 CB	0079		JNZ	FLOOP	Loop if not yet end
CB34 E1	0080		POP	H	Restore BASIC's registers
CB35 D1	0081		POP	D	
CB36 C1	0082		POP	B	
CB37 F1	0083	REENT	POP	PSW	Comes here when trace is off
CB38 C3 97 05	0084		JMP	BAKIN	Go back to BASIC
CB3B 00	0085		TFLG	DB 0	Trace flag, initially off
CB3C F0 D8	0086		PWR10	DW -10000	Negative powers of ten table
CB3E 18 FC	0087		DW	-1000	for statement number value
CB40 9C FF	0088		DW	-100	conversion to characters
CB42 F6 FF	0089		DW	-10	
CB44 00	0090		DB	0	Table's zero terminator byte
CB45	0091	PWRPT	DS	2	Pointer to powers of ten
CB47	0092	BUFPT	DS	2	Pointer to output buffer
CB49	0093	BUFFER	DS	6	Output buffer

CATEGORY	NORTH STAR VERSION 6 RELEASE 3	MICROPOLIS MICROPOLIS BASIC 2.0
Line Length (Characters)	132	250
Maximum Line Number	65535	65529
Line Cancellation Character	"@"	CNTRL-X
Multiple Statements per Line	YES (... ..)	YES (...:....)
Dynamically Allocated Files	NO	YES (AUTOMATIC)
Load Named File from Disk	YES (LOAD)	YES (LOAD)
Save Named File on Disk	YES (SAVE)	YES (SAVE)
Kill Named File from Disk	NO	YES (SCRATCH)
Create New File on Disk	NO	YES (SAVE N:)
Clear Program Buffer	YES (SCR)	YES (DELETE)
Print Disk Directory	NO	YES
Interrupt Program Character	CTRL-C	CTRL-C
Continue Interrupted Program	YES (CONT)	YES (CONT)
Program Trace Functions	NO	YES (FLOW)

Strings	YES	YES
Integer Data Types	NO	YES
Floating Point Types	YES	YES
True String Arrays	NO	YES
Scientific Notation	YES	YES
Max. String Size	LIMITED BY MEMORY	LIMITED BY MEMORY

Operators:		
Addition	YES (+)	YES (+)
Subtraction	YES (-)	YES (-)
Multiplication	YES (*)	YES (*)
Division	YES (/)	YES (/)
Integer Division	NO	YES (N)
Exponentiation	YES (+)	YES (+)
Less Than	YES (<)	YES (<)
Greater Than	YES (>)	YES (>)
Equal To	YES (=)	YES (=)
Less Than or Equal To	YES (<=)	YES (<=)
Greater Than or Equal To	YES (>=)	YES (>=)
Not Equal To	YES (<>)	YES (<>)
AND	YES (AND)	YES (AND)
OR	YES (OR)	YES (OR)
NOT	YES (NOT)	YES (NOT)

String Functions:		
ASCII Code of Char. in String	YES (ASC)	YES (ASC)
Return a Left Most Character	NO	YES (LEFT\$)
Return a Right Most Character	NO	YES (RIGHT\$)
Return a Mid Most Character	NO	YES (MIDS)
Return Smaller String on Compare	NO	YES (MIN)
Return Larger String on Compare	NO	YES (MAX)
Return Numeric Value of String	YES (VAL)	YES (VAL)
Return Length of String	YES (LEN)	YES (LEN)
Return String of Value X	YES (STR\$)	YES (STR\$)
Return String of Specified Char.	YES (CHR\$)	YES (CHR\$)
Repeat Char. n Times into String	NO	YES (REPEAT\$)
Determine if X\$ is a substring of Y\$	NO	YES (VERIFY)
Format Value X into String Y\$	YES (PRINT%)	YES (FMT)
Return Position of X\$ in Y\$	NO	YES (INDEX)

CATEGORY	NORTH STAR VERSION 6 RELEASE 3	MICROPOLIS MICROPOLIS BASIC 2.0
Files:		
Random Access	YES	YES
Sequential Access	YES	YES
Error Trapping	NO	YES
End of File Control Transfer	NO	YES
Dynamic Allocation	NO	YES
Create and Delete Under Prog.	NO	YES
Change End of File	NO	YES
Rename File	NO	YES
Change Attributes	NO	YES
Number of Tracks	NO	YES
Size (in Records)	NO	YES
Space Left on Diskette	NO	YES
Read-After-Write	Selectable	YES

Special Functions:		
Chaining Capabilities	YES (CHAIN)	YES (CHAIN)
Execute String as Prog. Statement	NO	YES (EXEC)
Set End of Memory	NO	YES (MEMEND)
8080 In Instruction	YES (IN)	YES (IN)
8080 Out Instruction	YES (OUT)	YES (OUT)
Examine Memory	YES (EXAM)	YES (PEEK)
Replace Memory	NO	YES (POKE)
Change Variable Default Precision	NO	YES (SIZES)
Change String Delimiter	NO	YES (STRING)

Miscellaneous:	(spec. order)	
Maximum Variable Precision	14 Digits	60 Digits
Max. Trigonometric Func. Prec.	14 Digits	20 Digits
Minimum System RAM	12K Bytes	24K bytes
Machine Language Link	YES	YES
User Defined Functions	YES	YES

Courtesy MINI MICRO MART

PTC REWRITES SOL AND HELIOS MANUALS

Processor Technology has issued rewritten Sol and Helios manuals to their dealers. The new manuals are now being packaged in new systems delivered, but from what I've read about them the new manuals don't make the old ones obsolete. The rewrites incorporate easier construction drawings, better identification of parts on parts lists and assembly drawings, and clarified introductory sections. The most major change is the inclusion of the Theory of Operations section in the Helios manual. This section is now 68 pages long, instead of the token 2 pages in the original release. In addition to information on the workings of the hardware, the section gives enough data to figure out how to program your own I/O without PTDOS. One notable fact is that the controller uses I/O ports F0 thru F7, so when adding other boards to your system be sure they don't need these ports for other purposes. I don't know if PTC plans to make the new section available to the earlier purchasers. Perhaps some arrangement will be made through Helium.

HELIOS DRIVER FOR CENTRONIX PRINTER

CONTRIBUTED BY EARL DUNHAM

```

*****
*   DPRNT      DISK TO PRINTER DRIVE
*
*   ENTRY:    HL HAS ADDRESS OF DATA BUFFER
*             DE HAS NO. OF CHARACTERS
*****
START ORG 0CAB4H
PRINTER EQU 0FDH PRINTER PORT
DTRB DW 0 NOT USED
DTRNB DW 0
DTRLB DW 0
DTWRB DW PRINT
DTWB DW PRINT
DTREW DW INIT
DTEOF DW INIT
DTCLO DW INIT
DTSEK DW 0
DTCTL DW 0
DTBLK DW 80
DTITO DB 1
DTINI DW INIT
CONBUF DB 12 FF<FORM FEED>
XXX DB 13 CR
*****
PRINT XTHL
INX H
INX H
INX H
XTHL COMPUTE RETURN ADDRESS
NXT IN PRINTER READ PRINTER STATUS
ANI 01
JNZ NXT JIF PRINTER BUSY
MOV A,M GET A CHARACTER
CPI 0AH LF CHECK
JZ SEND+1 JIF A LINE FEED
CPI 07CH DOUBLE WIDTH CHECK
JNZ SEND JIF NOT DOUBLE WIDTH
MVI A,0EH GET DOUBLE WIDTH CONTROL CHAR
SEND OUT PRINTER SEND CHAR TO PRINTER
DCX D COUNT IT
INX H
MOV A,D
ORA E
JNZ NXT JIF MORE CHARACTERS
XCHG
RET 0 RETURN
*****
INIT LXI H,CONBUF
LXI D,2
CALL NXT OUTPUT CONTROL CHARACTERS
RET
END

```

P. S.
REGARDING CREDIT:
THE DRIVER WAS WRITTEN BY
BOB EBY OF WHITTIER, CALIF.
A REAL TALENTED PROGRAMMER.
THE WHOLE THING ONLY WORKS
BECAUSE OF JOHN MOCK, A MOST
KINDLY, GENIUS-TYPE ENGINEER
WITH A LITTLE NON-STORE TYPE
OF OPERATION, "BITS AND BYTES",
IN FULLERTON CALIF.

EARL

The following descriptions of software that is soon to be released appeared in the March 1978 issue of The Personal Computer Retailer, published by Processor Technology Corporation for its dealers. Don't believe the release dates, but the other information may be credible.

FORTRAN

Processor Technology FORTRAN will be available on disk (\$50) before the end of March. The cassette version will be available mid-year.

The disk version is particularly noteworthy because it interfaces so well with PTDOS, our disk operating system. Disk FORTRAN supports most of the functions available from the PTDOS entry port area, thereby taking full advantage of the disk's mass storage capabilities. Information access is very quick. For example, in only one disk access the user can read any variable from any file.

The FORTRAN, a very good implementation of the language, includes the following functions:

- *Very explicit run time error comments during compilation and at run time
- *Eight significant digits of precision
- *String manipulation
- *Cursor functions
- *Hexadecimal constants
- *Direct in-line 8080 assembly language mnemonics accepted by the compiler

Except for the extensions, this FORTRAN is identical to FORTRAN IV but does not include COMMON or Double Precision statements.

PILOT

Processor Technology PILOT will be available in mid-1978 on both disk (approximately \$50) and CUTS cassette (approximately \$25.)

PILOT is a string-oriented, interactive language particularly well suited to computer aided instruction (CAI). The original version was developed by Dr. John Starkweather of the University of California Medical Center in San Francisco. Dr. Starkweather has custom tailored our PILOT to run on the Sol utilizing SOLOS I/O with direct screen cursor positioning and program & data files among the more notable features.

PILOT is a powerful language, very easy to learn and easy to use. It should be of interest to educators, educational institutions, psychologists and anyone developing testing programs or programs introducing computers to children.

8080 CHESS

The 8080 CHESS program, developed by Robert Arnstein of Houston, Texas, competed in the Eighth North American Computer Chess Championship in Seattle last October as part of the A.C.M. Annual Conference. Running in a Sol computer, it was the only participant running in a machine that was actually on the premises.

This was the first micro-processor-based chess program to compete in the annual match. We thought of it as David versus Goliath, the Sol against a giant Amdahl computer. Unfortunately, the Sol's pebble missed Amdahl's forehead but maybe next year!

Considering that the 8080 CHESS program is only eight months old (a mere infant) and was competing against some programs which have been in development for 6 to 8 years, it put in an excellent showing.

Meanwhile, Processor Technology will be distributing the program as a regular software package in cassette form complete with manual. It will retail for \$24.50. We hope to start shipping by May.□

Dear Stan,

For those people with BASIC5, there is an error in the demo program "LUNAR" in addition to the misspellings in MTCHS. Line 930 reads "GOSUB 800: IF I<=0 THEN 860." This error causes problems if the ship is climbing as a result of too high a burn rate.

The article on parallel memory was very interesting. However, if the appropriate 4K banks are chosen, the mod can be even simpler. If the two banks differ by only one bit then this bit can be tied high (or low depending on the select logic). This "don't cares" the selecting logic. For example, to use either ALS-8 or software no. 1, a block of RAM is needed from D000 to DFFF which is very hard to use for anything else. By "don't caring" a single bit this bank can be parallel with either 5000-5FFF or 9000-9FFF. Since I have 40K of RAM, the 9000 block is ideal. On the PTC16KRA board this mod involves lifting pin 11 of U41. This has no effect on the refresh circuitry.

For anyone interested in tweaking the PAUSE and INPUT delays in EXTENDED BASIC, because of a different clock rate, etc., the loop rate is set by a constant at locations 1268 and 1269 hex, low order first. This constant can be changed with a POKE statement after the program is running. If the change is to be permanent, it will be necessary to modify the initialization routine to get through the checksum test. The theoretical checksum is stored at 3F81-3F82 prior to initialization and can be changed consistent with the time constant change or the checksum test can be deleted (which will make other changes easier) by changing 3CAC to C3.

I would like to suggest that when someone gives a hardware mod, they list the revision level the mod is for. I bought my SOL in January of 1977 and it has a D revision for the main board. I know that they are at least up to E. While I try to keep my board up to date, PTC refuses to provide the necessary information. For example, SOL MANUAL ADDENDUM NO. 2 dated 7/77 states that the Revision E boards have added C74, R155 and R156, but don't give their values. With the particular recorder I'm using, the resistors are required to prevent intermittent relay operation. I have written PTC four times for the values and gotten no answer. By trial and error I went to 10 ohms. I don't know about the reference cap. So much for their customer service department.

For the analytical types, I suggest not using the random number generator included within EXTENDED BASIC; it's not very evenly distributed. I sorted the first million numbers and got the following results:

0.0 - .1	110207	0.5 - .6	104356
0.1 - .2	94560	0.6 - .7	90754
0.2 - .3	106796	0.7 - .8	97366
0.3 - .4	95985	0.8 - .9	105076
0.4 - .5	101236	0.9 - 1.	103686

The same distribution can be seen in samples as small as 100. While the distribution is OK for games, I would advise writing your own subroutine for serious mathematical analysis (e.g., working out blackjack systems).

I am currently working with a CD1802 processor at work -- both hardware design and programing. Does anyone have a program to do 1802 ASSEMBLY on a SOL? If not, would anyone have use for one if I wrote it? Due to the totally different architectures involved, it probably isn't feasible to write a translator but straight assembly isn't bad.

--Bruce Barron

Dear Stan,

Driver and hardware change to allow an Integral Data Systems ID-125 impact printer to operate with SOL.

This routine allows the printer to operate at any speed up to 1200 baud. I enter it at C900. It also allows the TV monitor to display the information as the printer is operating.:

```
EN C900:
: DB F8 2F E6 A0 C2 00 C9 78 D3 F9 CD 54 C0 C9
SET COUT C900
SET O = 3
```

The hardware changes made are as follows: use the "ACKNOWLEDGE" signal from the printer instead of the "CLEAR TO SEND." This requires disconnecting the CTS signal at the connector and running a short wire from the acknowledge tie point to the same pin as the CTS was tied to. On the SOL, tie the incoming acknowledge signal (which is at TTL level) to pin 2 of U37 after disabling pin 3 of U38 (I simply pulled U38 and bent pin 3 out of the socket).

--Doug Snyder

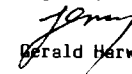
April 1, 1978

Dear Stan,

Do you know of anyone who uses MCA BASIC with a Sol? I have had several problems with it. It does not seem to read or write programs or files as indicated in the skimpy documentation, and it does not seem to have any provision for switching of output ports from basic. Aside from these drawbacks, it seems to be pretty good. For one thing it offers an alternative to the way in which PI EB handles strings.

Has anyone written an alphabetization program for PI EB?

Regards,


Gerald Harwood

P.S. Has anyone modified a Sol to produce a 72 or 80 character screen image?

2148 Jackson Drive
Bremerton, Washington 98310
3 June 1978

Dr. Stan Sokolow
169# Woodside Road #219
Redwood City, California 94061

Dear Stan,

I talked to you a few weeks ago, and got some information. I still haven't received a copy of SOLUS NEWS after Vol.1, No.3, but that may be expected. I am leaving for three weeks to Ohio, and wanted to write before going.

I tried to look up Dr. New, but didn't find him listed with the American Society of Anesthesiologists. Perhaps you could send me his name.

I am sending a copy of a letter to ProcTec about the trouble I am having with the Sol going down during times of a little overheating. I am one who doesn't like heat at all, and I try to make sure that things are as cool as possible...but the Sol is even less accepting than I, I think that it is a little too itchy, and want to see if I can get more reliability.

By the way...I don't know whether you have had a problem with them, but I have noticed that the people who staff computer stores are generally inarticulate and stupid. I have actually spoken to one at a store in Seattle whose conversation was limited to "Oh Wow" and, when I finally convinced him to sell a DOS and BASIC to another man, couldn't load it onto the disk.

The real problem is that people like me are buying our equipment from people like that. I think that ProcTec should make more of an issue of telling purchasers that there is a SOLUS and even about their own "access", which I just discovered.

Is there a chapter in the Puget Sound Area? If so, please let me know about it. If not, I might consider getting something together...but I haven't anywhere near the time nor dedication that you have...so it would have to be a slight contribution...but I have a fine mailing label program, and I would be capable of working that.

You might look into what has happened to my membership, in the event that there has been a new SOLUS NEWS published. Otherwise, I will be in touch, and sending little bits of advice and encouragement, as well as things that I have found that I can do with my SOL-N* combo. Sooner or later, a book on how to do things is needed, and we can all give you ideas for that.

With all best wishes,

Chuck
Chuck Bollinger

CDR, NC, USN

3 June 1978

Processor Technology Corporation
7100 Johnson Industrial Drive
Pleasanton, California 94566

Gentlemen:

I am writing to get some information about what might be making my SOL quit on me at times. I have spoken to the people who sold it to me (the Retail Computer Store in Seattle, and they mention something called a "probar"...though further questioning revealed nothing.

The first time I noticed it, it was on a warm evening in March. I had just returned from California (where I visited your factory). I was using the SOL and the CRT suddenly went blank...into an amorphous pattern of soft waves. The lights on the UPPER CASE and LOCAL keys were out, and no amount of keying would make it better. I turned it off and, after several minutes, I was able to use it again. My equipment at the time was the SOL-20/32 with a N* controller board. Since that time, I have added a Seattle Computer Products 16K static board, but that didn't seem to cause additional trouble. In fact, I was trouble free during the cooler weather and have only had two incidents lately. BUT, I don't have one of my 16 KRA boards in (it is being repaired, hopefully, by you).

I have also air-conditioned the room...but even when I am reasonably comfortable I find that this will occur.

I will appreciate any information you can give me. A copy of this letter, for information purposes, is being sent to SOLUS.

Yours truly,
Charles W. Bollinger
Charles W. Bollinger

TINP PROCESSOR + TTY 43

17

18

Gentlemen:

I recently purchased a Sol to see if I couldn't learn enough about it to set it up for data gathering and processing in a small business my wife has. As one who had an application for the machine, I was not at all aware of various equipment considerations, but I am learning fast....the hard way.

Realizing that I would benefit from the rapidity of disc loading, I purchased a North Star single drive. I also purchased an ALS-8 cassette, because I actually was getting into machine language programming a little.

From what the software man at ProcTec told me when he gave me your address, I have probably told you enough for you to understand my problem: The N* boots where the ALS-8 is supposed to work and, because of the memory map configuration of the firmware N* uses, I cannot even work around it and load with cassette to memory assigned in that area.

ProcTec does not want to get into customizing ALS-8, and point out that the silly location of the boot and the dos in the N* system will cause trouble forever unless it is corrected. I have to agree with them on that point.

I imagine that, for the Sol, the best place for the N* DOS would be B9FF to B9FF, and the boot just above that from BAFF to BDF. That would cram it up under SOLUS, leaving B-AFFF free for everything.

I am writing in the hope that you can give me the benefit of your experience. Most of the people here are good hardware types, but haven't much real use for a computer, and, while they are sympathetic, give me the impression that they somehow don't understand the fix I'm in.

I will be looking forward to hearing from you.

Yours truly,
Charles W. Bollinger
Charles W. Bollinger
Brewerton, Washington

Ed.: WE SENT CHUCK THE APRIL 1978 ISSUE, WHICH ANSWERED SO MANY OF HIS QUESTIONS HE CALLED TO THANK US,)

I am enclosing a copy of the article on the bugs in Processor Technology's Basics that I discussed with you at the Homebrew Computer Club meeting on April 12. I am also sending a copy of this to Processor Technology. If they send me a response of any significance, I let you know. I hope that you will find this of some use. I will send you another note in a couple of weeks detailing some algorithms for finding roots that may be also be of interest.

sincerely,

Ron Cardinale
Ron Cardinale

South San Francisco CA

(SEE RON'S ARTICLE IN THIS ISSUE. THANKS RON, AND DO LET US KNOW WHAT PTC SAYS.)

Perhaps I hold the record for the most far-flung SOL-20? NEW Delhi. Interest here hasn't picked up but as soon as I'm a little better organized, I hope to start a club, which should go over big as there are a lot of excellent programmers/computer experts here.

I would be interested in receiving cassettes with the software that's published in Byte, Creative Computing, KiloBaud, and that will run with 5K or Extended Basic, both of which I have. I find I'm not good enough to convert MIT's programs to Sol, yet, and of course, typing in is a drag if the dang things won't work, afterwards. In return, I'll send cassettes with the "Text" typed on but that may or may not work, but which could be loaded in by the recipient and adjusted to work, saving him/her all the typing. I don't know if anyone would be interested but I hope so. Of course, I'd always be good for the price of the cassette and postage, also.

Once I can get the club going, I'm sure Indians will import chips and build the rigs in rapid and rabid fashion, and I look forward to that stage. We need a place to meet, and that also will be a bottleneck.

Finally, I brought an IBM I70 73 back with me from the states, I'm just getting ready to convert it to 220V50Hz; has anyone done something on exactly how to go from a SOL 20 port to the 50 pin IBM jack and work? *(see read Frydman's article in Byte last year and the two follow up letters)*

Enclosed is my \$4 for the news, of course I don't expect you to answer my questions but if members come up with something in these areas, would you kindly pass it along?

Sincerely yours,

George Warner
George Warner
New Delhi ID
Department of State
Washington, D.C. 20520

Note my address for mail is Wash. DC. - (domestic postage)

Enclosed is the additional \$6, per Vol 1, No 3, I sent only \$4 before as printed in Kilobaud. Please do send the back issues for this year, I really find what your doing useful... for example, I already blew my power supply because I didn't have the note in No 3 about the + & - 16V at 2 & 52!!!; also, I want to buy a floppy and your notes are helping me decide which way to go in a rather confusing world of claims and statements that mean nothing to me.

My Sol 20 is down now as I had to return the keyboard to PT, so I'm watching the mail daily for its return. Once here, I hope to form a SOLUS club in India, but I'll have to look into the import problem first. There are a lot of highly talented, under employed software experts here and I hope to meet some of them.

Keep up the good work.

Sincerely yours,

George Warner
George Warner
New Delhi ID
Department of State
Washington, D.C. 20520

PS You can print my address on this and my first letter, if you want.

DEAR STAN.

I've jus. managed to convince my selectric terminal that it should talk thru my Sol Computer to Michael Shrayer's The Electric Pencil soo....who should I write to...

I've had my Sol since the first of the year. With some very good support from the guys at The Computer Mart of New Jersey, I got the beast working in a little over two weeks. Oh upper-case repeat, thy sting bites into the quick of my lower case heart.

The assembly of the kit went quickly and I would rave about it except for the errors in the manual. Errors in power supply connectors and prints are unforgivable, especially for a kit aimed at laymen. Tune for minimum smoke.

We all are aware of the five slot mombo by now, and I can recommend Extensys RM64 memory board as a cure. 64K in one slot and it works every time.

My North Star Disc has eaten a regulator or two thanks to the well known heat problem in the Sol. I think I've cured it by blocking off the keyboard side of the power supply causing the fan to draw it's air thru the card file and into the power supply thru the card guides. So far, after three months, no more heat failures. The North Star Disc, along with the Sol, has been working like a charm. The assembly was easy. In fact, I did it in one sitting in a hotel room in Virginia. I travel a lot and have never been able to put the night hours to work before.

My IBM Selectric Terminal is my most recent hardware addition thanks to the Alkin Model8B Selectric Interface. This device translates the parallel port output, ASCII code, to the EBCD code the selectrics use, all inside the Sol Computer.

Now if I could only teach The Electric Pencil and my Sol to correct my spelling.

My pet peeve is SOFTWARE. I have wasted hours upon hours, typing in dozens of worthless programs from many books that claim to work any basic. The worst offender has got to be The Software Library carried by most computer stores. The publisher advertises that the programs run on any micro-computer. After shelling out your hard earned money you find that "it aint so". The books are full of basic commands that don't exist on micros and yes, even a collection of miss spelled words.

Hurray for PT's new 8? k basic. Where were you when we needed you? Another non-standard disc system not using CPM. PT you're not paying attention.

On the positive side, for you students of North Star with file of Sol, AJA Software has been advertising a tutorial lesson on a floppy disc.. I have my copy and a quick glance answered several questions left by the slim basic manual from North Star.

I've taken enough of your space so let me close up shop.

Your last issue, in the new format, was, page for page, the best publication in the microcomputer field. Please, please keep up the good work.

Stuart M. Rudick
110 Manhattan Court
Jericho, New York 11753

I enjoyed reading Ron Parsons' article "My Sol and "/>M" on how he interfaced a Tarbell disk interface with his Helios II system. I want to do the same thing myself. Could you possibly get Ron to give more detailed information (such as a schematic) on how he went about modifying his Tarbell disk interface board. I'm particularly interested in how he went about implementing his I/O port so that he could switch from soft-sectored to hard-sectored modes via software. I'm not hardware oriented, but I can follow directions.

I ordered my Helios II system 1½ years ago. When I finally received my disk system (it took about a year), I only received a 1 page theory of operations. Do you or anyone know if Processor Technology plans to release a more comprehensive theory of operations? If so, do you or anyone have any idea when they plan to release it. I'm obtaining Marinchip's T.I. 9900 16-bit CPU on an S-100 card for my system. I need more detailed information on how the Helios II DMA disk interface works so that I can write my own disk I/O drivers for the T.I. 9900. I've asked the people at Processor Technology this question several times and each time I received some very vague responses. Sometimes they would say that the theory of operations was the 1 page I received and that I won't be getting anymore. Sometimes they say that they're working on a more comprehensive theory of operations, but that they don't know when it'll be released.

Thanks.

Sincerely,

Kenneth Young
Kenneth Young

Los Angeles, California

(EDITOR: DEAR KEN, I'M PASSING YOUR REQUEST ON TO RON, SEE MY DOCUMENTATION NOTE IN THIS ISSUE FOR MORE INFO ON HELIOS PRINCIPLES OF OPERATION.)

S-100 BUS pin 54 (External Clear) is left floating in the Sol. This has been known to cause problems in boards which use this signal. Specific problems have been observed in the Tarbell Floppy Disk interface board and the DCHayes Data Communications Adapter board, both of which may reset spontaneously because of noise on bus line 54. This is potentially a problem with any board which uses pin 54 for one of its reset conditions.

The solution is quite simple. Ideally, a pullup resistor (1000 ohms will do nicely) to +5 volts is installed on the Sol board itself. If this is inconvenient, the resistor may be installed on any board which is plugged into the Sol, but this is less desirable.

Sincerely,

Ron

Ron Findlay

I have enclosed a cheque for \$12.00 (U.S.) as enrollment in the SOL Users group. I am currently running a SOL 20 with 32K and the HELIOS disk system. I have seen a copy of the Newsletter and all I can say is keep up the good work!! I am really looking forward to getting my own copy.

Can you please let me know if anything like this is planned for HELIOS owners?? I would also appreciate knowing of any move to produce CP/M to run with the HELIOS. There is so much system software designed to run under CP/M it seems a pity to lose out.

How about getting PASCAL running on the SOL. We really need some language other than BASIC to get some decent software running. Alternatively Yourdon's "C" Compiler would be another good bet. I'm looking forward to hearing from you.

Yours truly,



Andrew Bates
Vancouver, B.C.

(Editor: Thanks for the compliments. The excellent contributors of articles and letters really deserve the credit for the quality of this newsletter.

With regard to HELIOS users, let me say this. I know that Processor Technology is sponsoring a users' group called HELIUM, which is being organized by Ian Kettleborough, the author of some of Processor Tech's software. PTC plans to make HELIUM its outlet for software updates to its disk software, so membership in HELIUM will probably be essential for HELIOS owners. However, the close association between HELIUM and PTC will most likely be reflected in the policies of HELIUM. Consequently, I plan to encourage and support HELIOS users in SOLOS. Indeed, it makes much more sense for PTC to have a unified users group, since in most cases their software will be tailored for their own product line, SOL+HELIOS. So, yes in the future you will be reading more and more HELIOS articles. SOLUS plans to continue its policy of cooperation with and independence from the manufacturers.

I am planning a software interface to let CP/M application programs run under PTDOS, while thinking that they are talking to CP/M. This would let us transport the CP/M library over to HELIOS. If anyone else is working on this, please contact me.)

HI STAN,

15 APRIL 1978

RECEIVED THE "SOLUS NEWS" TODAY AND AM IMPRESSED BY THE AMOUNT OF INFORMATION AND CORRESPONDENCE AVAILABLE IN THIS ISSUE. I VOTE FOR THE NEW FORMAT.

I WONDER HOW MANY SOL/MICROPOLIS USERS THERE ARE AMONG THE GROUP?

I WOULD ALSO LIKE TO TAKE THIS OPPORTUNITY TO SAY THAT I HAVE THE HIGHEST REGARD FOR THE MICROPOLIS DUAL DRIVE DISK SYSTEM AND ESPECIALLY THE PEOPLE WHO MAKE UP THE MICROPOLIS COMPANY. THEY HAVE BEEN THE MOST COOPERATIVE AND CONCERNED PEOPLE I HAVE HAD THE PLEASURE OF DEALING WITH AND I WOULD RECOMMEND THEM WITHOUT RESERVATION.

IF ANY OF THE MICROP. USERS ARE HAVING TROUBLE WITH ARRAY INDEXING ERRORS OR STRING INSERTION STATEMENTS FOR A PROGRAM SUCH AS THE BIORHYTHM CHART PLOTTING PROGRAM, THE INDEXING ERROR CAN BE SOLVED BY PLACING A SIZES STATEMENT AS THE FIRST STATEMENT IN THE PROGRAM. I USE "XXX SIZES(5,3,51)" AHEAD OF THE DIM STATEMENT

TO INSERT A CHARACTER INTO A STRING:

XXX O\$="

THIS STATEMENT DESIGNATES THE LENGTH OF THE STRING AND XXX IS THE HEX ADDRESS.

XXX X=ALGORITHM TO GENERATE POSITION OF CHARACTER TO BE INSERTED.

XXX L\$=LEFT\$(O\$,X-1):R\$=RIGHT\$(O\$,LEN(O\$)-LEN(L\$)-1)

XXX O\$=L\$+"P"+R\$! WHERE "P" IS CHARACTER TO BE INSERTED.

IF YOU ARE STILL USING BASIC VER. 2.0 AND WOULD LIKE UPPER AND LOWER CASE YOU CAN DISABLE THE AUTOMATIC LOWER TO UPPER CASE CONVERSION BY TYPING IN 2 IMMEDIATE COMMANDS AFTER LOADING BASIC:

(1) POKE (16R5454)=16RC9 <CR> = CARRIAGE RETURN

(2) POKE (16R1B52)=16R7F <CR>

THIS CHANGES 5454H FROM FE TO C9 AND 1B52H FROM 60H TO 7F. YOU WILL NOW HAVE UPPER AND LOWER CASE BUT NOTE THAT ALL BASIC STATEMENTS AND COMMANDS OTHER THAN STRING CONSTANTS MUST STILL BE ENTERED IN UPPER CASE ONLY. FILES MUST STILL BE SAVED IN UPPER CASE.

THE ABOVE INFORMATION WAS SUPPLIED BY COURTESY OF THE MICROPOLIS CORP. INCIDENTLY, IF YOU DON'T SUBSCRIBE TO THE MICROP. SOFTWARE UPDATE SERVICE, DO SO, IT IS THE BEST BARGAIN IN TOWN.

UPDATE REGARDING MICROPOLIS HANDLING OF PERIPHERALS

ON PAGE 3 OF DEC. 77 ISSUE I COMPLAINED ABOUT THE LACK OF PROVISIONS FOR SUPPORT OF PERIPHERALS BY THE MICROPOLIS SYSTEM. THIS WAS THEIR EXT. DISK BASIC VERSION 1.1. UNFORTUNATELY, DUE TO THE TIME LAG BETWEEN THE LETTER AND PUBLISHING DATE IN THE SOLUS NEWS, I RECEIVED MICROP. EXT. BASIC VER. 2.0 WHICH INCORPORATED A PRINTER HANDLER PROGRAM WHICH COULD BE CONFIGURED TO SUIT YOUR PARTICULAR PRINTER REQUIREMENTS AND WAS UP AND FLYING SHORTLY AFTER THE ISSUE WAS PUBLISHED. I HAD BUSS IN THE PRINTER THAT HAD TO BE WORKED OUT AND CAUSED CONSIDERABLE DELAY IN GETTING ON LINE. NOW TO THE GOOD THINGS

I HAVE RECEIVED THE NEW MICROPOLIS "PROGRAM DEVELOPEMENT SYSTEM VERSION 3.0" AND THIS IS A TREMENDOUS IMPROVEMENT, WITH DOS, ASSEMBLER, BASIC VER. 3.0 ETC. ELEVEN DEVELOPEMENT AND OPERATING PROGRAMS IN THE SYSTEM PLUS THE PRINTER HANDLER AND UPPER AND LOWER CASE.

I NOW NEED AN 8080 DISSASSEMBLER AND A PROGRAM RELOCATER COMPATABLE WITH THE SOL/MICROPOLIS AND THEN I CAN GET DOWN TO BUSINESS.

I AM VERY MUCH INTERESTED IN THE DENSE GRAPHICS ADD ON FOR THE SOL BEING DEVELOPED BY PTC. NOTE PTC'S SILENCE. COMMENDABLE!

JERRY LENZ AND I HAVE BEEN CORRESPONDING AND IT HAS BEEN INTERESTING AND INFORMATIVE. I WOULD BE GLAD TO HEAR OF ANY TRICKS OTHER SOL/MICROP. USERS HAVE DEVELOPED, SUCH AS RANDOM ACCESS TO FILES FOR READ AND WRITE. IF YOU'VE DONE IT LETS HEAR IT, IF YOU WANT IT DONE LETS HEAR IT...

VOL. 1 NO. 3 GREAT ISSUE STAN, KEEP UP THE GOOD WORK.



ELDRD LORD

- have just bought a SOL and would like to become a member of SOLUS and receive your new letter.

One particular SOL problem that I have involves the interface with a Teletype model 3841-4EG printer. Both SOL and the Teletype are ASCII machines but there are differences in the special characters such as +, -, *, /, =, (, and). I would greatly appreciate any assistance that SOLOS members can offer. I am using the SOLOS personality module and BASIC 5.

Sincerely,

Gary E. Abercrombie

Gary E. Abercrombie
Auburn, Ala. 36830

As a new Sol 20 and Helios II owner, I am very interested in getting together with other Sol owners.

I purchased my Sol System III from The Computer Place in Toronto, Canada, last January. They were the ones that gave me your address.

I would like to join your users' group. Please send me a bill for any costs.

The Sol computer system is very good, however, I find the documentation is very poor. It is advertised as a home/business computer but, I find that you almost have to be an engineer to understand it.

I would actually prefer to pay someone who would advise me on how to set this system up, for my business. Do you know anyone that would be interested?

Thank you very much.

Yours truly, R. W. Roocroft,
Box 9850,
Winnipeg, Manitoba,

I am very interested in learning more about the Sol User group and its activities. I am a (proud?) owner of a Sol 20 computer and am currently using the Sol and my peripherals in my private business.

My current system includes:

- 1 Sol 20 Terminal Computer/with 16K RAM (soon to be 32K)
- 1 Superscope cassette recorder
- 1 Sony 12 BW TV with homebrew RF input
- 2 Northstar Minifloppy Drives/Controller Board/etc.
- 1 Diablo HyTerm Terminal Printer

My major software includes (to date):

The Northstar Disk Operating System personalized for Sol
Northstar Disk Basic

The Electric Pencil wordprocessing software by Michael Shrayer (I am using it to compose, edit, and print this letter)
Processor Technology Extended Cassette Basic

I really do like my Sol but I have certainly had my fill of Processor Technology from time to time. Fool that I was, I got in at the beginning - February of 1977 - I paid cash in advance!!! I'm sure you can fill in the rest of that absurd tragedy! Needless to say I was extremely disappointed I waited 4 months for my Sol (even though the brochure said delivery-stock to 30 days) and I am still waiting for some of the software OVER A YEAR LATER!!!

I would love to use the PT 8K Extended Basic since it seems to be truly superior in form and function to Northstar's Disk Basic. Northstar's Basic has considerably fewer functions and the documentation is cryptic. Unfortunately, using the cassette for file storage makes the system far too slow. I will be the first to admit that the PT Basic documentation was fairly impressive. It would, no doubt, be too much to ask that they provide listings that would enable patches to be made to Northstar's DOS.

I would be interested in hearing from anyone with similar equipment and problems. Anyone have Northstar compatible software for business or home applications? Do you know of anyone who has tailored ProTech's 8K Cassette Basic to the Northstar DOS? I am no computer wiz, but if I can possibly be of service to anyone in the Users Group (especially in the Ohio - Cleveland area) just let me know.

Well, I guess that ought to do it for now. Enclosed please find a check for the SOLUS Newsletter. I am looking forward to receiving more information on the users group and its services and activities.

Sincerely,

Jared F. Harrison

Jared F. Harrison VIII

Jared F. Harrison
5046 Taylor Road
Bedford Heights, Ohio 44128
(Cleveland)

DEAR STAN:

HERE'S THE SIX BUCKS I OWE ON MY SUBSCRIPTION. FOUR WAS RIDICULOUS I NOW REALIZE, HAVING READ SOLUS. THE ENCLOSED LITTLE PROGRAM IS A HELIOS TO CENTRONIX-PRINTER DRIVER (ONE OF THE MOST DIFFICULT TO WRITE AS ANY HELIOS OWNER KNOWS). MORE ABOUT LATER.

I MUST TELL YOU A STORY, A HEARTENING ONE I THINK, ABOUT A COMPANY THAT CARES ABOUT ITS CLIENTELE. WE RECENTLY BOUGHT TWO HELIOS II'S TO GIVE OUR SOL-20'S THE CAPACITY, SPEED, AND FLEXIBILITY THEY NEED FOR OUR LARGE FILE OPERATIONS. WE HAVE BECOME SO USED TO THE TYPICAL COMPUTER STORE TREATMENT (ONE SALE TO A CUSTOMER AND PLEASE TAKE YOUR PROBLEMS ELSEWHERE) THAT WHAT WE EXPERIENCED REGARDING PROBLEMS WITH THE HELIOS DESERVES TELLING.

ALTHOUGH THE PROBLEMS WERE MINOR OUR DEALER AND OTHERS THAT WE CONTACTED DIDNT UNDERSTAND THE HARDWARE OR THE PTOS. I WAS RELUCTANT TO LET THEM DO "EXPLORATORY SURGERY", SO I CALLED PROC TECH. BOB GROPPA (THE HELIOS EXPERT) LISTENED TO MY STORY AND SINCE WE WERE TO BE IN THE AREA SUGGESTED WE BRING THE UNITS IN SO THAT THEY COULD EYEBALL THEM RATHER THAN TRY TO DIAGNOSE BY PHONE. WE DID. HE DID. AND WHAT A SURPRISE! IN THE PLEASANT SURROUNDINGS OF THEIR NEW LOCATION WE FOUND OUTSTANDING COURTESY AND UNDERSTANDING. WHILE WE WENT ABOUT OUR BUSINESS THEY RAN THEIR TESTS, DID SOME MINOR ADJUSTMENTS, RAN THE UNITS ON THE EXERCISER FOR 18 HOURS. TWO DAYS LATER THEY DELIVERED THE UNITS ERROR FREE, REPACKED FOR THE TRIP HOME, AND GAVE ME A DETAILED ACCOUNT OF WHAT HAD BEEN DONE. NO CHARGE BUT LOTS MORE OF THE CHEERFUL COURTESY AND ENCOURAGEMENT. WELL THATS IT; NOT THAT I FEEL THAT ALL PROC TECH PRODUCTS ARE PERFECT, BUT SINCE WE ARE ALL COMMITTED SOMEWHAT TO THEM I FEEL THAT COMPLIMENTS AS WELL AS PANNING IS DUE WHEN APPROPRIATE.

ABOUT THE DRIVER. SIMPLY ASSEMBLE IT TO A BINARY FILE, RE-TYPE IT "D", AND ITS READY TO COPY TO. LOCATED IN THE SOLOS USER AREA IT WONT BE WRITTEN OVER BY THE DOS BUFFERING OR PROGRAMS. FOR DOUBLE WIDTH CHARACTERS TYPE AT THE END OF A LINE. FOR TOP-OF-FORM IF ONE HAS IT, TYPE A "w" AS THE LAST LINE.

NOW WHO CAN HELP ME? I WOULD LIKE TO SEE WHAT SOMEONE ELSE HAS DONE ABOUT INCREASING THE COOLING ON THE BEAST. FIVE FULL SLOTS WITH THAT CONTROLLER IS GOING TO COOK THE WORKS TO RUIN. AND THAT PATHETIC BACK-PLANE; THERE IS LOTS OF ROOM IN HELIOS, HAS ANYONE DONE IT? THATS ALL. TOO LONG A LETTER BUT IT ALL IS TRUE AND I HOPE HELPFUL.

SINCERELY:

EARL DUNHAM

LA HABRA, 5/11/78

I am writing to pose some questions about my SOL Terminal Computer using extended cassette Basic. If the answers are not immediately available from some obvious source, I would appreciate your printing these questions in hopes that some of the readers might have solutions:

1. Does anyone know of a software patch or some other means by which I may be able to acquire a double precision capability?
2. Is there any way I can make modifications to permit me to read and write in Tarbell format?
3. What adjustments are needed in order to use Tarbell at 800 bits per second?

Sincerely,

John W. Shortall III

John W. Shortall III, NA Holiday, Florida, 33590

Some information on my Digital Group Printer. (ref Oct. SOLUS) After an exasperating time and much cursing, I finally gave up trying to get it to work with my SOL and turned the whole thing over to my 15 year old son. He promptly wrote the necessary software driver for printing both upper and lower case (as you can see by this letter) and is now working on a driver for bidirectional printing! Since, apparently, a few SOL owners have bought this printer or are thinking about it, a few comments are offered.

The print mechanism (manufactured by Practical Automation) is basically good; it's the interface by Digital Group which is the real kludge. I agree with Ken Young's appraisal that the board is a mess. It is full of unused holes, leftover connector pads and mysterious markings. It looks like something which was salvaged from a junk heap. The documentation provided by DG for assembly and checkout can be described in one word - terrible. For example, there were three correction sheets for wiring the power supply, none of which were dated as to which came first or last and - ALL THREE WERE WRONG!

SOLUS members take heart. Once you overcome the obstacles thrown at you by DG the printer works well with the SOL. It doesn't quite make the 120 cps claimed by DG (with an 80 column line spaced on an 8.5 in. page it's more like 60) but it's still the best full width printer available for the money. I had to add one IC to the circuit to take care of an annoying tendency for it to print two dots at the end of each line. I'll be glad to contribute a copy of my corrections and software to the SOLUS library for those who are interested.

QUESTION: I am typing this with Michael Shrayer's Electric Pencil. If I provide a copy of the text on cassette tape can you use it to format for possible printing in SOLUS News? How about an ALSS text file?

THINGS I'VE DISCOVERED ABOUT THE SOL:

I can't jump from my Northstar DOS to PT software using the JP command without a crash. Anyone know why? If I use memory boards totalling more than 20 watts heat dissipation, the SOL fan can't hack it. The temperature rises inside the cabinet to the point where the memory goes flakey. Extra fans mounted on the back cover will take care of it.

NOTE TO PTC: How about offering an optional cover with holes already cut and extra fans for us hard users. I hear that the Helios boards run hot too.

I'm looking for patches to the Extended Cassette Basic to be able to save and load programs on my Northstar disk.

I've seen your comments about the 16K RAM boards from Seattle Computer Products. I haven't tried them but I have tried the ones from Base 2 of Los Angeles. In my opinion they are good quality and work well in the SOL. They use the same chip (TMS 4044) and include such features as software protect/unprotect, bank select and power on clear (optional). They will give a price discount on orders of 5 or more boards. Price: \$300.00 each for the 250 ns version at the 5 quantity level. Order 16KSZ from:

Base 2 Inc.
PO Box 9941
Marina Del Rey, CA. 90291

Sincerely,

Joe Maguire

Joe Maguire
1-72 Horinouchi
Yokohama, Japan 233

The new format for SOLUS NEWS is just fine, and the contents are improving with every issue. I think that SOLUS NEWS could be published every six or eight weeks, and still be valuable to SOLUS members. Maybe that would make it easier on you?

Is there anything new regarding those "rumors" from Processor Tech? I notice that they are now advertising their FORTRAN and PILOT software (I still don't have my FOCAL!) I've written to PT several times, but outside of being thanked for my interest, I haven't been able to get a thing from them. They won't even send me their current price list!

Enclosed with this letter is a two-page description and listing of one of my recent efforts. I've been using PT's Extended Cassette BASIC for a while now, and I'm impressed by its power. However, this BASIC does not have one feature that is available on several lesser interpreters--the "statement trace", which displays the line number of each statement as it is executed. After wishing for such a feature through several programming efforts, I finally spent some time going through BASIC to find an appropriate location to patch in a trace routine call. I succeeded, and the results of my efforts are presented in the stuff enclosed. Maybe other SOLUS members would be interested.

Thank you for your time and efforts spent on behalf of SOLUS.

Yours truly,



John Osudar

HELIOS NOTES

Since my last letter, I have received my Helios system. The first item which comes to mind is that a marriage between Solus and Helium (Helios Users Membership) is clearly indicated. There is just too much interaction between the hardware to have separate user groups. There can be separate people involved but only one publication.

My first reaction to Helios is favorable. It seems to be a very powerful system - if I ever get to understand it fully! My pre ownership anticipation of blitz speeds in comparison to my Northstar, however, just didn't materialize. In fact, some operations seem slower than the NS. I know some are going to say that you can't equate the two systems but I don't agree. True, the MSDOS and PTDOS have little in common but how about the NS running under CPM? I don't have CPM for my NS so I can't evaluate it against Helios but I would like to hear from someone who has. Is Helios really worth more than three times the price?

Some problems I've had with Helios I never had with my NS. After about a week of operation I suddenly started getting many read and write errors. It turned out to be dust or dirt on the heads. It seems the Perci drive is rather intolerant in this regard and now I find I must clean the heads every few weeks which is not just a few minute job.

A bug in the system seems to be present when using disk Basic. At times, when saving Basic programs, PTDOS slaps full protection on the file making it useless. In other words all the attributes are enabled making it impossible to read, write, kill or change the file in any way. It's just stuck there on the disk taking up space. A query to PTC got the response that if I send them the disk they will kill the files for me but they refused to tell me how to defeat the attribute protection. I consider this to be a serious handicap and one of the items I am

eagerly awaiting to read in Helium/Solus News.

Other goodies gleaned from my conversation with PTC:

The DI which appears in place of track number 19 when using the RECOVER command is not a bug. It's there to tell you that that is the file directory track and is recover protected.

There is no way to format a blank disk under PTDOS 1.4. The required procedure is to copy another formatted disk with the DISKCOPY command. This requires that you keep a spare pristine formatted disk on hand just for this purpose, a waste. I was told that PTDOS 1.5 will have a format command when it appears.

The file RESIDENT which is on the system disk and has full attribute protection is not a leftover from system development but in fact PTDOS. You cannot read it but the system can on bootup. Since PTDOS is resident in RAM after bootup and can be examined with the Solos DUMP command, it is a mystery why PTC has read protected the file. Oh well!

The reason for no physical write protection capability on the disk was explained by noting that PTDOS uses overlay techniques. In other words, the system is constantly reading and writing back and forth onto the disk during normal operation and a write protection tab would not permit this. (unlike the NS, the disks in Helios are constantly turning during normal operation) I was assured that the software protection was entirely adequate to prevent inadvertent writing on the disk but within three days of this pronouncement I had a memory failure in the PTDOS RAM area which caused the disk to garbage up two or three files before I could shut it off. My advice is to make backup copies of everything and in some cases backup the backups!


OTHER NOTES

I notice that the INTeger function in extended Basic does not work correctly for negative numbers. PTC notes that INT only truncates in their change notice but that doesn't fix the problem. Any help?

There are mistakes in the memory test programs given in the 16KRA and the 32KRA manuals. If you have the newly printed manual, the one with machine set typeface, then read on. The old ones are OK. In the 16KRA manual, where it describes the long test, it says to load and execute the program at C900 but in fact, the program is shown assembled to run at zero. The 32KRA mistake is more serious. If you faithfully type in the code for the long test as shown it won't work. The problem is that several pages are misplaced in the manual. When typing in the code, carefully note the addresses. You will notice that you must jump ahead a few pages then back up one or two. If you don't get lost in the process the program will work when executed. I was told that this was a printers layout error. Don't hold PTC responsible for everything!

I like the new newsletter layout. I sometimes have to get out my 10 power magnifier but I like the increased number of tidbits. Keep up the good work.

Sincerely,



NEWS RELEASE...

WHAT IS FORTH?

Forth is a unique threaded-tree language ideally suited for microcomputers. Some features:

(A) Extremely compact programs. E.g. the Forth system for microcomputers typically takes 5K bytes (of which 4K is written in Forth). This 5K is the complete operating system including floppy and other I/O drivers, the interactive Forth compiler, a text editor, virtual memory, plus an assembler (optionally used to optimize critical routines). And it all runs in the same 5K, with no overlays, swapping, or use of any other memory except for buffers and storage of source programs.

(B) All the convenience of interactive interpreters, but with execution speed overhead of 20 to 30 percent for 16-bit machines, 70 to 100 percent for micros (before any optimization in assembly).

(C) Structured, modular programming (there is no GOTO), user-defined variable types, exceptionally convenient debugging, and re-entrant object code suitable for PROM.

(D) Software development times cut by half or much more over assembly language.

FORTH TODAY

We have found that where Forth is available it almost totally replaces assembly language for applications where assembly would have been used - and often replaces Fortran or other higher-level languages. Today Forth is in use at probably more than a hundred installations.

But most computer people have never heard of Forth. It is fairly new, and from 1970 to 1974 was available only through educational institutions. Since 1974 it has been available as a software product from Forth, Inc. (Manhattan Beach, Ca.) for some machines. Currently it is also available through DECUS for the FDP-11 and FDP-10. Another factor delaying general use is that the system takes some getting accustomed to, because programming is very different from any other language.

We are starting the Forth Interest Group because we believe that this language is ready to take off in the industry, and will greatly increase the usefulness of small computers. The Forth Interest Group is non-profit and not connected with any vendor or other company. We share information on how to get access to Forth or implement it oneself, and we hold occasional seminars.

To get on our mailing list, send your name and address and preferably something about your interests or what you would like to do to

Forth Interest Group
787 Old County Road
San Carlos, Ca. 94070

JOB OPENINGS

TECHNICAL WRITER for data sheets and technical articles. Prefer someone actively involved with Sol or other small computer. Knowledge of both hardware and software. Additional duties in our Marketing Department will include copy editing for ACCESS, participation in trade shows, and development of user manuals. Job can be designed around your interests and abilities. Excellent salary. Contact Elizabeth Fairchild at (415) 829-2600. PROCESSOR TECHNOLOGY CORPORATION, 7100 Johnson Industrial Drive, Pleasanton, California 94566.

H & H is a search firm devoted solely to the location of individuals earning \$20,000 or more in the areas of science and engineering. As an executive search organization, we are entirely employer retained. The opening we would like announced in your newsletter is as follows:

BS OR MS/EE - N. CALIF. LOCATION - MIN. 2 YRS. EXPR. IN SOFTWARE SYSTEMS APPLICATION. MUST BE ABLE TO WORK WITH CIRCUITRY DESIGN & INTERFACE W. SOFTWARE. SCIENTIFIC APPLICATIONS EXPR. A PLUS. COMPANY WILL PAY RELOCATION. SALARY RANGE 20-30K. CONTACT M. GRAEBNER - HUMBERGER & HUMBERGER, 701 WELCH RD., SUITE 208, PALO ALTO, CALIFORNIA 94304 -- (415) 327-5245.

COMPUTER ARTICLES WANTED

Popular Electronics

ONE PARK AVENUE NEW YORK 10016 (212) 725-3500 3564

STAN:


PE is looking for articles -- both construction and tutorial, from any of you guys out there in sunny CA.

Can you pass the word out to the SOL Users Group, Homebrew Club, Joe's Bar and Grill, etc.

Have interested writers contact me at above address. If they have a phone, they can call me at above number.

Payment is indecently high, fame is assured, movie contracts available, get to meet famous people, and we give Green Stamps.

cordially


Les Solomon

LOCAL CHAPTERS

Atlanta, . George Reeves, 5002 Crowe Drive, Smyrna, Ga, 30080
Tel: B 404/881-8800, Ext. 325; H 404/436-0718

Austin, Tx: Ron Parsons, 9001 Laurel Grove Drive, Austin, Tx, 78758
Tel:

Barstow, Ca: James Fackstuhel, P.O. Box 1271, Barstow, Ca, 92311
Tel:

Bellingham, Wa: Sehome Computer Club, 2700 College Pky, Bellingham, Wa, 98225

Chicago, Il: Thomas A. Digate, 1366 S. Finley Road, Apt. 3S, Lombard, Il, 60148

Dallas/Ft. Worth, Tx: Ron Jones, P.O. Box T, Sherman, Tx, 75090

Evansville, In: Robert Heerdink, P.O. Box 3835, Evansville, In, 47737

Gurnee, Il: Vic Wiseman, 7960 Grand Oaks Court, Gurnee, Il, 60031

Livermore, Ca: George Bush, 442 Fontonett Avenue, Livermore, Ca, 94550

Montgomery, Al: Harold Drake, 759 Mulzer Blvd., Maxwell AFB, Al, 36113

Oakland, Ca: Richard Deal, 6957 Saroni, Oakland, Ca, 94611
Tel: 415/339-1111

Okanogan, Wa: Joe Thomason, Box 528, Okanogan, Wa, 98840

Princeton, NJ: Rod Montgomery, 52 Birch Avenue, Princeton, NJ, 08540

Redding, Ca: Darnel Rawlings, 3075 Churn Creek Road, Redding, Ca, 96001

Sonoma County, Ca: Earl Herr, 17 Spring Hill Drive, Cazadero, Ca, 95421

Ottawa, Canada: Barrue Ridsdale, 31 Ivy Crescent, Ottawa, Ontario, Canada, K1M-1Y1

Saskatchewan, Canada: Bob Stek, Regina Mental Health Clinic, 1942 Hamilton St.,
Regina, Saskatchewan, Canada, S4V 037

San Francisco Peninsula: SOLUS, Box 23471, San Jose, Ca, 95153

Washington, D. C.: Jim Loagan, 6817 Melrose Drive, McLean, Va, 22101
Tel: 703/356-1068

Los Angeles Area: George Pond, 14919 S. Normandie Avenue, Apt. 28, Gardena,
Ca. 90247

Rochester, NY: Warren Harkness, 32 Larchwood Drive, Pittsford, NY, 14534

Tampa, Fl: H. O. Kellerman, 1901 Cattlemen Road, Sarasota, Fl, 33522
Tel: 813/371-2486

Tallahassee, Fl: Mitch McCann, Rt. 7, Box M.L.C., Tallahassee, Fl, 32301

New York: Stanley Veit, Computer Mart of N.Y., 118 Madison Avenue, New York,
NY, 10016

White Plains, NY: Fred Cohen, The Computer Corner, 200 Hamilton Av,
White Plains, NY 10601

Sacramento, CA: Dick Smith, 5519 Valhalla Dr., Carmichael, CA
95608.

TO JOIN A LOCAL CHAPTER, CONTACT THE CHAPTER'S COORDINATOR LISTED ABOVE. TO FORM YOUR OWN CHAPTER, CONTACT SOLUS AT OUR P.O. BOX AND GIVE US YOUR CHAPTER'S AREA AND YOUR CONTACT ADDRESS. PHONE NUMBER IS OPTIONAL.

PCNET NEWS

REPRINTED FROM HOMEBREW COMPUTER CLUB NEWSLETTER

PCNET News Dave Caulkins

This is the first in what we hope (schedule and our queue length permitting) will be a regular series on the activities of The Personal Computer NETWORK (PCNET) Committee. This first column is on Ward and Randy's Community Bulletin Board System (WRCBBS).

The WRCBBS is an electronic mail type community bulletin board system. The system can be used by anyone with a 110 or 300 baud Bell 103A type modem equipped terminal or computer. Operation is simple - suppose Tom wants to send a message to Mary; he calls the WRCBBS (it operates unattended 24 hours/day) and as soon as the connection is established sends several carriage returns, which the system uses to figure out whether he is 110 or 300 baud. From this point on the system is self-teaching; even naive users should find it hard to get confused or in trouble. Tom invokes the functions he needs and types in his message to Mary, and then logs off. Some time later (which may be anywhere from minutes to weeks) Mary calls the system, reviews the list of messages, and retrieves the one from Tom. She can, if she wants, leave an answering message for Tom.

The WRCBBS was built from concept to operation in 30 days for \$1500 (plus some donated equipment) by two CACHE and PCNET members, Ward Christensen and Randy Sues.

The system consists of the following equipment: An IMSAI 8080 with 24KB of static RAM, an INOVEX 410 soft sectored floppy drive with a Tarbell controller, and a D.C. Hayes 80-103A modem. The WRCBBS has excellent human factors, comparing favorably with message systems like MSG and HERMES which run on PDP-10 size machines and are substantially more expensive.

The system commands are all single character. Experienced users can concatenate strings of them with the delimiter ';' to eliminate unwanted 'Help' information. String searches can be made of the TO, FROM, SUBJECT and DATE fields of the message headers. There is a lot of other neat stuff.

The best way to get the flavor of the WRCBBS is to try it. The WRCBBS number is 312-528-7141; between 11 PM and 8 AM and on weekends the rate (from Mountain View) is \$.20 for the first 3 minutes and \$.15 for each additional minute.

The PCNET Committee is actively working to set up one or more WRCBBS systems in the Bay Area; watch this space for more details. □

Homebrew Computer Club
NEWSLETTER

P.O. Box 626, Mountain View, CA 94042

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IMPORTANT ITEM

If you're like me, I'm sure you'll find this issue better than ever. The quality and quantity of Solus News has progressed far beyond my expectations and I want to thank all of our contributors who make this possible.

As editor, I've really been a one man production staff, with professional help in the typing, printing, and mailing, but still a lot of work falls on my shoulders. The time has come when I can no longer devote as much time to the production of Solus News, but I still want to participate in the editing and management. Consequently, I will be contacting the people who have offered help in the past and who are in the San Francisco Bay area, to set up a newsletter committee. The committee will get together once every other month to put together the contributions, write news items, and produce the camera-ready copy.

I would like to see the scope of SOLUS expand so that we can foster special-interest groups, such as business data processing, medical/dental/health care, engineering, education, etc.. I also would like to produce a periodic directory of Sol compatible products. Moreover, I would like some time to write several useful programs for our library and some tutorial articles.

If you would like to see Solus News remain viable and continue the excellent growth it has begun, please contact me to serve on our committee. If we have enough participants, the load on each one of us will be easy. I'm sure you'll find the project rewarding since it gives you access to inside information, new products, and interesting people.

Please contact me at my address shown on the front page. Remember, this is for a committee in the local San Francisco Bay area.

Thanks,

Stan

Stan Sokolow



BLK RT

SOLUS NEWS
P. O. BOX 23471
SAN JOSE, CA 95153
U. S. A.

James D. McElroy
2826 Crest Ave. N.
Allentown, PA 18104

SOLUS NEWS

PUBLISHED BY THE SOL USERS' SOCIETY

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AUGUST/SEPTEMBER 1978

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ADDRESS NEWSLETTER CORRESPONDENCE TO THE EDITOR. SEND ALL OTHER CORRESPONDENCE TO THE SOL USERS' SOCIETY, P.O. Box 23471, SAN JOSE, CALIFORNIA 95153. SUBSCRIPTIONS ARE AVAILABLE THROUGH MEMBERSHIP IN SOLUS. INDIVIDUAL DUES ARE \$10 (U.S. CURRENCY) IN USA, CANADA, AND MEXICO; \$15 ELSEWHERE. DEALER MEMBERSHIPS (\$25) AND MANUFACTURER MEMBERSHIPS (\$50) ALSO INCLUDE EXTRA SERVICES. MEMBERSHIPS EXPIRE AT THE END OF EACH CALENDAR YEAR. NEW MEMBERS WILL RECEIVE BACK ISSUES FOR CURRENT YEAR.

SEPTEMBER MEETING TO FEATURE PTC SOL SOFTWARE

As we mentioned in the last issue, Processor Technology will send a representative to our next meeting to discuss the PTDOS operating system and other software topics. The meeting will be Sunday, September 17, at the usual place--the Varian Physics Building auditorium on the Stanford University campus, Palo Alto, CA. See the enclosed map for details.

If you can't attend but have some burning (or stinging) questions for PTC about their software, especially PTDOS, please send them to me at my editorial address above. I'll do my best to get answers for you and publish them.

OOPS! LAST ISSUE HAD PRINTER'S GOOF

I must apologize for the printing error in the last issue which forced the reader to turn the pages in a very unconventional way. The printer put a new man on our job and he didn't quite understand what I thought I said. Hopefully this issue will be more convenient.

SOLUS SOFTWARE DIRECTORY: CALL FOR LISTINGS

Solus News has undertaken the job of producing a directory of Sol/Helios software. The following letter was sent to all PTC dealers and anyone else who produces software that I thought might have something to list in the directory. The directory will be sent to all Solus members at no charge as part of the newsletter. If you know of some nice piece of software that should be in the directory, let us know the name and address of the author or original distributor so we can send him a listing form. If you want to sell one of your programs, ask us for a form. The deadline for receipt of the forms is the end of September, so hustle.

NOMINATIONS ARE OPEN

SOLUS has been in operation for over 1 year now. The present officers have been active for more than that time, since they operated as the organizing committee as well. We feel the time has come for an election of new officers.

The next issue will have a ballot. Nominations are now open for President, President-elect, Secretary, Treasurer, Librarian, and Editor. If you would like to serve in any of these capacities, let us know.

EDITORIAL: THE FUTURE OF SOLUS NEWS

As you may recall, the "Important Item" in the last Solus News issue was a call for volunteers in my vicinity to become members of an editorial board. I was contacted by one person, Bob McLean, whose heroism is appreciated by yours truly. Also the regular contributions of Ron Parsons and other authors have been invaluable. The assistance of Ben Milander, our treasurer, has been a continuing lifesaver.

However, the overwhelming amount of work still falls on my desk. The enthusiastic praise of our readers and the lack of volunteers forces me to make a compromise in my desire to keep Solus independent of the manufacturers. I plan to maintain editorial control, but turn over the nuts and bolts of producing the newsletter to the publications department of Processor Technology. I'll send them the manuscripts ready for typing or layout, and they'll take it from there. Bob Marsh, V.P. of PTC, has offered this assistance and has always been very willing to support Solus. I don't anticipate any problems with the new arrangement, although it does violate my principle of independence. I don't think there will be any effort to influence the content of the newsletter, in spite of the barbs we now and then hurl at PTC. Bob has expressed satisfaction with the operation of Solus and realizes that the criticism is often justified ("...we are our own worst enemy...").

I'm going to give the new arrangement a try, and if it doesn't work out we'll try something else.

— Stan

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INSTRUCTIONS FOR SOLUS DIRECTORY LISTINGS

SOLUS NEWS
The Sol Users' Society
S. M. Sokolow, Editor
1690 Woodside Road, #219
Redwood City, CA 94061

August 16, 1978

TO: Software authors and distributors

RE: SOLUS Software Directory

Dear Sirs:

The Sol Users' Society is the official users' group for owners of Processor Technology Corporation Sol computers and of other computers that are Sol-compatible. We have members throughout the United States and Canada, and in several other foreign countries. SOLUS is preparing a directory of software that is tailored to run on such computers. The list will be published as a special issue of our newsletter, SOLUS NEWS, at no charge to the software vendor.

To qualify for listing in the directory, a program must be compatible with the Sol's standard operating systems, namely SOLOS/CUTER or PTDOS. (We realize that many SOLUS members have Northstar, Micropolis, and CP/M disk systems, so we will consider any program that runs under those systems if it is in some way tailored to run on Sol or Sol-like systems.)

Software vendors should complete the SOLUS Directory form enclosed and send it to the address shown above. The forms will be photo-reduced and printed just as received, so be sure to use standard typewriter size (10 or 12 pitch). A carbon film ribbon reproduces best. If more forms are needed, please write to us rather than reproducing the given forms yourself--we want uniform print quality.

Since we want to avoid unnecessary duplication of efforts, please only submit listings for software of which you are the original manufacturer or the exclusive distributor. We don't want every dealer to send us forms for programs they simply retail. Forms for programs which are available through local dealers should indicate this in the ordering information. Please follow the instructions on the enclosed sheet.

If you know of software other than your own which you think should be listed, please have the author or distributor use one of your extra forms, or have him write for some.

The deadline for the first edition of the directory is Sept. 30, 1978.

Thanks for your participation. We feel that this sort of directory is the best way for vendors to reach their market and for users to find the products they want.

Yours truly,

Stanley M. Sokolow

1. PROGRAM NAME: Give the mnemonic name for the program or package.
2. CATEGORY: Select one or more from the following: Operating system, Programming language processor, Text processor, Business, Education, Health professions, Law, Science, Engineering, Recreation, Home, Data base, I/O driver. If your program doesn't fit any of these categories, please make up one to suit your type of program.
3. DESCRIPTION: Briefly describe what your program does.
4. MINIMUM HARDWARE REQUIRED: Describe the smallest system on which your program will run without severely restricted capability. Give the bytes of RAM needed, making it clear whether this includes the operating system's RAM or not. Mention the peripherals needed, such as type of disk, a special terminal, etc. Mention the recommended amount of RAM if the program can be adapted by the user to take advantage of more RAM than the minimum. For example, PTC's Extended Disk BASIC needs 16K plus 4K or more for program space plus 12K for PTDOS.
5. SOFTWARE REQUIRED: This refers to the operating system or programming language processor which the product also requires but which is not provided in the package being described. Common examples: SOLOS/CUTER, PTDOS, CP/M, NORTHSTAR DOS, PTC ECBASIC, PTC EDBASIC, PTC BASIC/5, PTC PILOT, etc.
6. RESTRICTIONS: Mention anything that isn't obvious.
7. DOCUMENTATION: What supporting documents are provided in the standard price? What documents are available for an additional amount?
8. MEDIA: On what recording media is the program available? Examples: Helios diskette, CP/M 8" diskette, Northstar diskette, SOL/CUTS cassette, etc. We envision the SOL/CUTS cassette as the least common factor among all SOLUS members, so cassettes may be a convenient interchange medium, even if the software on them runs under a disk operation system. For example, standard CP/M (8") and mini-disk CP/M users can both read the cassette and copy the file to their disk.
9. DATE CURRENT VERSION WAS RELEASED: This will allow present users of the product to see when an improved version is available.
10. WARRANTY: How many days will you allow for exchange of a defective copy of the software? For how many days will you repair program bugs or documentation errors? ("Repair" means providing machine readable patches to the program or replacement pages for the documents.) For how many days will you notify the buyer that the errors exist and how they may fix them? Example, "10 day exchange, 90 day repair/replace, 6 months' notification."
11. PRICE: Also mention any additional charges, such as postage, handling, or taxes. Credit cards?
12. ORDER FROM: Give mail-order address. Also mention if product is available through retail dealers.
13. REMARKS: Mention anything that hasn't been covered.

Remember that these forms will be reproduced as-received, so be sure you make them camera-ready. Use clean dark type. Corrections made with opaque correction fluid ("liquid-paper") will be invisible. Please confine your typing to the space provided.

See the example enclosed.

Thank you.

A SOFT-SECTOR DISK CONTROLLER FOR THE HELIOS

By Ron Parsons

In the April 1978 issue of SOLOS NEWS, I outlined a method by which I use the Helios II disk drives with a Tarbell floppy disk controller board. The Tarbell board provides an interface between the S-100 bus and a variety of disk drives using soft-sectored diskettes. Adding soft-sectored capability to the Helios opens access to the CP/M operating system from Digital Research and the software from the CP/M users' group. The U.C.S.D. Pascal system is also configured to run on soft-sectored diskettes. And best of all, adding soft-sector capability requires absolutely no changes to the Sol, the Helios controller/formatter boards or the Helios disk drives.

The Tarbell board is designed to operate with a number of different types of disk drives by allowing the owner to custom-configure the board with a number of jumpers. There are also four 16-pin prototyping sockets on the board with lands for jumpers to each pin. The board has provision for two 50-pin ribbon cable connectors.

I wanted to be able to have both the Helios and Tarbell controllers in the system at the same time so I could share files between PTDOS and CP/M (or Pascal) via memory. I also wanted to be able to switch between the Helios controller and the Tarbell controller under software control.

To do this I use two unused gates and two unused inverters on the Tarbell board to build an R-S flip-flop which drives a multiplexer consisting of 12 pairs of tri-state buffers. These buffers are installed in the four prototyping sockets. Short wire-wrap pins are placed in the lands next to the prototyping sockets, the 50-pin connectors, and the jumper lands. All additional wiring is done on the component side of the board using the wire-wrap pins except for the R-S flip-flop where I use jumper wires on the back of the board.

A short 50-wire ribbon cable connects the drive connector on the Helios to J2 on the Tarbell board. Signal lines from the Helios drive to the controllers go to both controllers at all times. The ten output signal lines from the Helios controller go to one set of inputs of the tri-state multiplexer buffers. The ten output signal lines from the Tarbell controller go to the inputs of the other set of tri-state multiplexer buffers. The output of these buffers are connected to each other in pairs and one buffer of each pair is enabled by the R-S flip-flop. The state of the flip-flop is set by unused outputs of U-56 on the Tarbell board. The Helios disk drive is connected to J1 on the Tarbell board.

The figure shows all necessary additional wiring and components. I added a 2.2k resistor to 5V on U28-10 since noise on bus line 54 (EXTCR) caused erratic operation of the interface with the bus line floating. The head-load timer was discussed in the June 1978 issue of SOLUS NEWS. Resistors R4, R8, and R12 are deleted because only one line from the disk for index, track 0, and data is available. Gates U42, U61, and U62 are replaced by 74LS00s as the high drive 7438s are not needed to drive the multiplexer. I also removed U18, U19, U23, and U37 and disabled the on-board bootstrap, putting the bootstrap in the SOLOS proms.

Only two lines from the Helios disk drive behave differently depending on whether soft- or hard-sector diskettes are used. As the PerSci drives in the Helios come configured, output line 8 is separated index and line 20 is separated sector when a hard-sector diskette is used. With a soft-sector diskette, the index pulse is on line 20 and no signal is on line 8.

The Tarbell or Helios controller is selected by sending certain binary data to the Tarbell command port (XC or X4 hex). A boot command for SOLOS is shown in the listing. The boot allows the user to select either PTDOS or a soft-sector system (in my case, CP/M or Pascal) with the commands 'BOOT PTDOS' or 'BOOT CP/M' respectively. The binary data sent to the Tarbell command port has the following meanings:

data	comments
xxxxx000	Negative pulse at E32
xxxxx001	Negative pulse at E21 (fast seek)
abcdx010	(see below) Set high on POC
xxxxx011	Selects Tarbell controller
xxxxx100	Selects Helios controller

Explanations

x	don't care
a	high - enables DRQ/INTRQ interrupt low - enables seek complete interrupt
b	high - nothing low - slow restore to track 0
c	high - selects drive 1 low - selects drive 2
d	high - selects disk 0 low - selects disk 1

The Tarbell jumpers I used were:

R3	R4	
R7	R8	
R11	R12	
E46	E48	connect XRDY
E1	E13	direction select
E3	E11	pull up
E5	E10	pull up
E7	E14	fast seek pulse
E29	E31	on-board drive mux
E33	E34	restore
E39	E40	pull up
E40	E41	pull up
E30	E38	ground E38
E43	E44	ready
E54	E55	disk select
E51	E53	(or use head-load timer)

This same multiplexer technique can be used with slight modifications with other hard-sector controllers. These revisions were made on Tarbell model 1011A and on Helios controller Rev. E.



You want it when?!

Item	Shipment Begins	Change
ASSM, Advanced 8080 Assembler	week of August 7th	moved back one week
8080 Chess Cassette	week of August 14th	moved back two weeks
Gamepac 2	week of August 14th	on schedule
Debug, Advanced 8080 Debugger	week of September 4th	on schedule

NOTE: Math Pack Video Calculator has been cancelled as a product. In a recent marketing session, the consensus was that our Extended BASIC offers far more to the user than the Math Pack program. Please advise customers who have asked for this software of this cancellation.



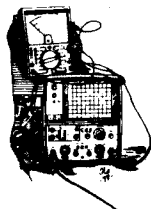
New extended BASIC option

A recent letter to all Processor Technology dealers announced the new family of BASIC's. Included is an option which converts any Extended BASIC disk (currently 8-digit precision) to 6, 10, 12, 14 or 16 digits of precision. This option is available to all authorized Processor Technology dealers

Dealers can customize the level of precision at the time of sale or retroactively for Sol users who would now like the advantages of greater precision, particularly for accounting applications.

Programs written in the original

version of Extended BASIC will be fully compatible after the conversion.



HyType manual correction

Please make the following correction in your HyType II manual, Section 5, page 5-2, Table 5-2, "U13 Decoder Truth Table."

Reverse the headings of column 5, "Paper S" and column 6, "Carriage S." The table should read:

Table 5-2. U13 Decoder Truth Table

INPUTS			OUTPUTS			
ISSUE S	POD4	POD5	RESTORE	CARRIAGE S	PAPER S	CHAR S
L	1	1	Active	--	--	--
L	1	0	--	Active	--	--
L	0	1	--	--	Active	--
L	0	0	--	--	--	Active

(Press release from P.T. to dealers)

New SOLOS/CUTER Manual Benefits All Sol Users

A greatly expanded second edition of the SOLOS/CUTER Manual is now being shipped with all Sols.

After looking it over I'm sure you'll agree with us that all Sol users, old and new, will benefit from the useful additional information contained in this new edition. Therefore, we encourage you to notify your customers of the availability of the new manual.

These manuals are available for immediate shipment. The suggested retail price is \$5.00.

The new issue of ACCESS will also carry an article on the new edition. Manuals will be available for end-user purchase directly from the factory for \$5.00. We will, however, make it clear that these manuals are also available through the local dealers.

KEY CHANGES IN THE MANUAL

1. All command descriptions are expanded and clarified.
2. Procedures for the use of the cassette recorder controls are now integrated with the command procedures.
3. The use of typesetting allows for easier reading. Quicker reference also is possible because of a special "monospace" typeface which is used to denote all dialogue with SOLOS.

Several important new sections have been added:

1. Section 1.6. Deals with entering commands. Describes various functions in SOLOS and how they may be edited and used.
2. Section 5, System Interfacing. Instructs the user on how to call SOLOS sub-routines from other programs.
3. Appendix I. Gives general tips on using cassette recorders for data storage.
4. Appendix II. Contains a complete chart of ASCII Codes.

Stan:

Below you will find my "publishable" address and phone number. I'd like to form a "Valley Forge" Chapter as opposed to the "Philadelphia" Chapter mentioned in your note. Also, if you get any inquiries from anyone else in my area (suburban Philadelphia), I would appreciate it if you would put them in contact with me so we can get things "rolling" on this end. Thanks.

Bruce A. Blank
202 Ross Road
King of Prussia, PA 19406
(215) 265-0828

5

CP/M Users Group

Digital Research once more congratulates the CP/M User's Group on doing an excellent job of collecting and distributing contributed software. They presently have 24 volumes (diskettes) of programs, which are available for \$8.00 each (this includes the cost of the diskette and the shipping). To get on their mailing list, send \$4.00 to:

CP/M Users Group
164 West 83rd St.
New York, NY 10024

The CP/M User's Group also distributes Microsoft FORTRAN-80 and BASIC at discounted prices.

Software Support Representative

Digital Research has a full-time software support representative, John Pierce, available to answer telephone calls regarding Digital Research software. You may call him at (408)-649-3896 if you have technical questions or need assistance with Digital Research software.

Two New Printer Interfaces Announced News Release

Two new printer interfaces for the Sol Computer have been announced by Processor Technology Corporation. Both increase the hard copy capability of the Sol Computer.

Sol Hytype I mounts inside any Diablo Series 1200 Printer connecting it directly to the back of the Sol. Similarly, the Sol Hytype II Printer Interface works with the Diablo Series 1200 Printer. The installation package includes the fully assembled, tested and burned-in printed circuit board, software, all cables and mounting hardware. No modification to the Sol is necessary. No holes need be drilled in the printer. The printer can be restored to its original condition if required.

Hytype driver software is included on CUTS cassette along with a source listing. The user may modify the driver software to suit a particular application.

Suggested retail price for both the Hytype I and Hytype II is \$150. Delivery is stock to 30 days.

For more information, see your Sol dealer, or if more convenient, address Processor Technology

Corporation, 7100 Johnson Industrial Drive, Pleasanton CA 94566. (415) 829-2600.

Diablo and Hytype are TMs of the Xerox Corporation. □

Sacramento Chapter
Dick Smith
5519 Valhalla Dr.
Carmichael, CA 95608
Meets first Tuesday each month.
4745 Watt Ave., 8:00PM
California State Services Bld.



Solos News

July 17, 1978

I'm not too sure how it works, but an article on how "CPM" is utilized (memory map) would be nice. If there are common entry points to be used by "CPM" and UCSD Pascal, couldn't Processor Tech modify their non-standard system? Perhaps Pascal will just replace both.

Tom Wilson
APO San Francisco

DSAT: A Descriptive Statistics Program
by Stan Sokolow

Here's a simple program to compute some basic statistics on a list of numbers. It's written in PTC Extended Disk Basic. (I assume it will run on Extended Cassette Basic too, with the possible exception of the error trapping commands in lines 65 and 71).

DSTAT: DESCRIPTIVE STATISTICS

```
10 LET S=0: LET N=0
20 LET S2=0
30 PRINT "DESCRIPTIVE STATISTICS: ENTER A LIST OF NUMBERS,"
35 PRINT "ONE NUMBER PER LINE."
40 PRINT "ENTER 'END' AT END OF DATA"
50 INPUT Y$
60 IF Y$="END" THEN GOTO 200
65 ERRSET 900
70 LET X=VAL(Y$)
71 ERRCLR
75 IF N=0 THEN LET L=X: LET U=X
80 LET S=S+X
90 LET S2=S2+X*X
100 LET N=N+1
110 IF X>U THEN LET U=X
120 IF X<L THEN LET L=X
199 GOTO 50
200 IF N=0 THEN END
205 PRINT "COUNT=",N
210 PRINT "MEAN=",S/N
220 PRINT "SUM OF SQUARES=",S2
225 IF N=1 THEN GOTO 260
230 LET V=(S2-S*S/N)/(N-1)
240 PRINT "VARIANCE=",V
250 PRINT "STD. DEVIATION=",SQR(V)
260 PRINT "MINIMUM=",L
270 PRINT "MAXIMUM=",U
280 END
900 PRINT "INPUT ERROR. TRY AGAIN"
910 GOTO 50
```

3/1/78

Solus News
San Jose, California 95153

Dear Editor:

I was lucky enough to get one of the first copies of Cassette PILOT to arrive in Atlanta. I would like to begin my comments by saying that PTCO did an outstanding job on this program (they should have -- it took them long enough!) The file-handling and editing capabilities are particularly good. In looking over the PILOT program, I noticed a few interesting things I wanted to pass on to our members.

First, a funny thing happened to me the first time I used the EDITor -- I couldn't get out of the EDITor and back to PILOT! I was running on an Altair using CUTER in ROM. The SOL "MODE" key causes an editor exit, but I don't have a mode key and ctrl-g had no effect. To make a long story short, other CUTER users can fix this problem by making these changes:
>EN 1841 (cr)
:00 00 00 00 / (cr)
>EN 184B (cr)
:00 / (cr) (This is the character recognized to exit)

Another problem I found was the lack of a backslash key (\). This is needed to return to the restart point from a PILOT program. A little searching revealed that the character used to accomplish this is stored at 1642H. I changed this to ctrl-g (00H), but other characters could be used as well.

I noticed that memory locations 0-100H are used only for the stack. Since I sometimes like to use a hardware reset to get back into the program, I entered a jump to PILOT restart at 0 : C3 03 01. This is just a quick timesaver.

Finally, I noticed something very interesting. PILOT itself does not have any particular provisions for handling immediate commands, so the crafty folks at PTCO wrote a short program in PILOT language to accept keyboard input and branch to the proper routine. You can examine this program, which begins at location 1DD0H, using the SOLOS/CUTER DUMP command, or an ASCII dump routine if you have one. The benefit of knowing this is that you can alter the commands accepted in the immediate mode. For instance, you can cause R to be accepted in place of RUN, E for edit, etc. As of now, you have to enter the changes in hex through SOLOS/CUTER, but I bet someone out there can figure how to let us EDIT this immediate-mode-handler. We also need to know how and where PILOT stores the beginning-of-user-text pointer so that we can make it longer as well as shorter. Lets hear from you out there.

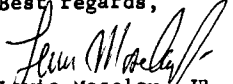
Pilot has a checksum routine, so its best to create your new program this way: Load PILOT, Execute at 100 to deactivate the checksum routine, exit PILOT with the BYE command, make your changes by SOLOS/CUTER, then SAVE 0-1FFF.

Another possible suggestion: You might want to change the immediate mode handler for custom versions of PILOT which are preloaded with programs for students. By eliminating some commands, you can make these special versions fool-resistant. (Nothing is foolproof, since fools are so ingenious) Here is an example:

```
(Existing text, or text changed with due attention
to the location of *)
*% T:
T:THIS PROGRAM TEACHES ABOUT AREAS AND VOLUMES
T:
T:TYPE 'RUN' TO BEGIN
T:TYPE 'LIST' TO VIEW THE PROGRAM ITSELF
T:TYPE 'END' WHEN YOU ARE THROUGH
T:
A:
M:RUN
IEFY: IEP means interpret existing program
M:LIST
LISTY:
M:END
ENDY:
M:EDITX Note hidden command for teachers use.
EDITY:
TN:I DON'T UNDERSTAND YOU. READ THE DIRECTIONS AGAIN.
FOOTN:
J:*%
```

Here are a few things I think we all could use: Some-one or some company who would accept CUTS - format tapes and use them to program 2708 or 2716 ROMS. A set of several utility programs which could be loaded into SOLOS/CUTER as Custom commands to test memory, move blocks of memory, relocate programs, etc. And, how about some PILOT programs.

Best regards,


Lewis Moseley, JR.
2514 Glendale Court NE
Conyers, Georgia 30207



3/03/78

SOLOS NEWS

Dear Editor:

Since writing last, I have figured a way to use the PILOT editor to edit the PILOT immediate-mode-handler. I do say "works", even though it is somewhat cumbersome. There is probably a better way! Pay particular attention to the execution addresses, and the note on the *% label - they are important.

Some may ask why you would want to change the handler. First, because it's there! Also, some useful improvements can be made. In addition to allowing single character immediate commands (R for RUN, L, E, etc.), you might want to add new statements. Now, if you enter an invalid immediate command, you might not know it. But, if you add these statements at the end of the handler, after the IEFY: and before the OH:, there will be no doubt:

IN:WHAT?
FOOIN:

Anyway, here's how to do it:

>GET PILOT (cr) By SOLOS/CUTER
>EX 100 (cr) To disable checksum
BYE (cr) To exit PILOT
>EN 106 (cr) PILOT's Begin-of-program-buffer address
:DD 1D/ (cr) set to start of imm-mode-hdlr
>EX 103 (cr) PILOT restart (IMPORTANT - DO NOT EX 100)
EDIT (cr)

(Now, make your changes using the EDITor commands. Notice the label *% near the beginning of the handler. If you make any changes above that point, see the note below. Scan the handler with ctrl-R and ctrl-C to check your work.)

Do a HARDWARE RESET to SOLOS/CUTER. IMPORTANT - DO NOT attempt to exit the editor with the (MODE) key.

Use SOLOS/CUTER DUMP or an ASCII dump to locate the end of the modified handler. It will end with several (cr)'s (0DH), followed by a (01H). Note the address of the SECOND 0D.

IF YOU MOVED THE *%, also note the address of the new location of the *.

>EN 106 (cr)
:(Here, enter the new ending address you noted above, low-order byte first) / (cr)
IF YOU MOVED THE *%, do the following two steps:
>EN 427 (cr)
:(Here, enter the new address of the *, low-order-byte first)/(cr)

>EX 100 (cr) To reset PILOT's internal pointers
BYE (cr) To exit PILOT
>SAVE PILOT 0 (ADDR) Use the address entered at 106 above + 1

WHAT AN EFFORT! But, it works.

Lewis Moseley, Jr.
Convers, Ga.



2514 Glendale Ct.
Conyers, Georgia 30207
August 5, 1978

Micropolis Corporation
7959 Deering Avenue
Canoga Park, California 91304

Gentlemen:

I am one of a large and constantly growing group of users of Processor Technology's SOL computer (and of other 8080 computers using PICO's video and tape boards and CUTER software). Although the SOL units are quite powerful, as tape based computers go, we still have a need for a compatible disc unit. Few of us can afford \$2000+ for a SOL Helios, but many can afford a smaller amount for a mini-disc.

At the present time, your disc units and those sold by North Star appear to be the principal mini-disc units. Judging from magazine articles and ads, N* seems to have a considerable lead, which is somewhat surprising to me. Your DOS and BASIC both seem to be better than North Star's, your discs hold twice as much, and your price is less!

I have a suggestion which may help you to gain an edge on N*. In addition to hardware compatibility, SOL users need a few special touches in software for a product to have maximum utility. Assuming you have, or have available, the source code for your software, it should take only a few manhours to prepare versions of your DOS and BASIC "customized" for SOLOS/CUTER users. The following is an outline of the special features. If you are interested, other SOL users and I can provide details.

INPUT-OUTPUT

SOLOS provide standard routines for input and output. Four different routines are available for input and four more for output, but there is a common subroutine entry point for each group of 4. Your software should do input and output by calls to these entry points.

EXTRA COMMANDS

The following commands should be available from DOS, as immediate BASIC commands, and as BASIC program statements. They set various parameters used by I=O by SOLOS. Each involves storing a single byte of data in the SOLOS RAM area.

SET I= stores a byte, with a value between 0 and 3, which selects which of the four input routines will be used

SET O= as above, but for output
SET N= sets the number of nulls to follow a (cr)
SET S= sets the speed of the video display, between
O and FF, with O the fastest

Micropolis Corporation
7959 Deering Avenue
Canoga Park, California 91304
(213) 703-1121

TAPE BACKUP

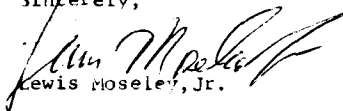
CSAVE and CLOAD should be available as BASIC commands to allow backup copies on tape of programs created under BASIC. These can rely on block save and block load routines in SOLOS. Basic would only have to build or read a tape header block in SOLOS RAM, and appropriately set its own interval pointers. The header contains file name, load address, block size, and file type byte. It would also be nice to have tape backup of editor-assembler files.

DOS ADDRESS

SOLOS and the VDM display use the 4K block between C000 and CFFF. Most PDS programs (games, etc) load at 0, so the area from 0-3FFF (minimum) should be avoided. Ideally, the user should be able to select the DOS address at load time, but an area in pica memory, say 4000 - 3FFF could be used. Looking to the future, you could probably arrange to put 4K on your controller board. The above applies to your resident and PDS modules-BASIC and the utility programs can load at 0.

A customized product like this would greatly benefit SOL owners, and would give you a competitive advantage in selling to them. If you are interested, let me know and I will try to provide you with the necessary details.

Sincerely,


Lewis Moseley, Jr.

August 8, 1978
2040

Lewis Moseley, Jr.
2514 Glendale Ct.
Conyers, Georgia 30207

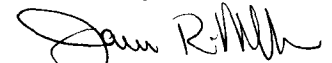
Dear Mr. Moseley:

Thank you for your letter of August 5th and your positive comments about our floppy disk systems. We presently offer our software with an internal configurator for the Processor Technology SOL-20 microcomputer system. All I/O is directed to the SOLOS monitor and many of your suggested alterations are possible with minor changes to these drivers.

We also offer reassembled versions of our software located at 2000H and 4000H. These packages would allow the SOL-20 user to execute existing application software while utilizing the Micropolis disk systems.

I have submitted your letter to Software Engineering and would like to again thank you for your suggestions.

Sincerely,


James R. Molenda
Product Support Specialist

JRM:es

cc -- B. Roffman

MICROPOLIS™



2514 Glendale Ct. NE
Conyers, Ga. 30207
August 12, 1978

1 (1)

May 22, 1978

Mr. James Molenda
Micropolis Corporation
7959 Deering Avenue
Canoga Park, CA 91304

Dear Mr. Molenda:

Thank you for your prompt reply to my recent letter regarding customizing your hardware/software product for SOLOS/CUTER users. In these days of horror stories about vendor neglect, it is good to hear from a company which seems to care!

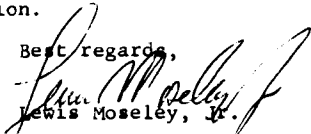
In considering my suggestions, please keep two things in mind: 1) Your company has the source code, and therefore can make the changes with (relatively) small effort. 2) You only have to do it once, and many users can benefit from your effort. Otherwise, many people have to repeat the same effort, and they still end up with a butchered product.

One last suggestion (and, one which will probably greatly upset your men who keep the keys to the software locker): Make a copy of your source code on disc available to our user's group (SOLUS, POB 23471, San Jose CA 95153), with suitable agreements to protect your product, and allow the group to make the necessary source modifications. The resulting software could then be distributed either by the group for use on your hardware, or returned to you so that you could provide it.

Again, with source code it's easy; without it's a real job.

Thanks again for your consideration.

Best regards,


Lewis Moseley, Jr.

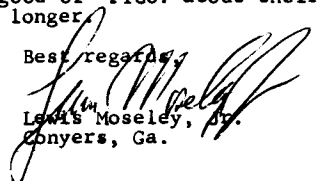
August, 1978

OPEN LETTER TO SOLUS MEMBERS

One of the principle benefits of an organization such as ours is the ability to exert mass pressure on vendors, etc., to obtain favorable treatment. Enclosed are copies of letters I exchanged with the Micropolis Corporation, in which I explained in brief the special software features which would benefit our members. Their reply seems encouraging, even though they made no commitment. If everyone reading this would also write to them in support of my proposal, they might well agree to provide us with this useful hardware/software combination.


If this works out, we might well consider running a LETTER-of-the-MONTH to other vendors to request their support. We might even write a few to good ol' PTCO. about their refusal to provide source code any longer.

Best regards,


Lewis Moseley, Jr.
Conyers, Ga.

I have a Cromemco "Bytesaver" and would like to put last 8K of ALS-8 from cassette tape in PROM in the Bytesaver. This would leave the 4K RAM containing the system symbol table, IOBR, cust command table, and DP80 stuff to load from cassette tape. I have been unable to get ALS-8 to run in this manner. Is there any modifications required to ALS-8 to do this?

Regards,


Charles C. Josey
210 Lewis Street
Montezuma, Ga. 31063

Dear Stan:

Greetings from Colorado! I really enjoyed the last issue, lots of good letters and reviews. Here is my contribution for the next issue.

Has anyone out there in SOLUS land patched the PTC Ext. Cassette Basic to North Star DOS in order to save files on disk? How about it someone - (Gordon French are you listening?)

The N.S. DOS will not function properly with the S.D. Computer Products "Expandoram" Dynamic memory board, if it is addressed at 2000H. However, it can be addressed, at a higher location, say where BASIC runs without any problems. It also runs super cool with 16K filled. It is well worth the initial \$151.00 in my estimation. A full review is in the works.

The Denver Amature Computer Society (DACS) is off to a new start with a mini show being planned for November.

Also, the Denver SOLUS Chapter has been formed. If interested, see my "open Letter" elsewhere in this issue.

Time to go, Stan. I would really like to see this published once a month if possible.

Very truly yours,


Rick Downs

RE: SOLUS CHAPTER

2148 Jackson Drive
Bremerton, WA 98310
30 July 1978

Dear Denver Area SOL Users:

Another SOLUS Chapter has been formed! This is the first one in the Denver area that we know of.

At present only one meeting has been held with future meetings being planned. If you are interested in participating in this SOLUS Chapter, we would like to hear from you.

Please feel free to contact me at the phone numbers or address listed below.

We would like to hear from everyone interested in the Denver area. You do not have to own a SOL Computer to join.

Sincerely,

Rick

R. Downs, Jr.
Chapter Coordinator

9995 E. Harvard Avenue
Denver, CO 80231
(303) 751-7283 (Home)
(303) 758-1122 (Ext. 3768) (Office)

July 12, 1978

Stan Sokolow, Editor
SOLUS News
1690 Woodside Rd., #219
Redwood City, CA 94061

Dear Stan:

Excuse me for bothering you again, but I haven't heard from SOLUS since the April issue of SOLUS News. Have you been busy, or have you lost/forgotten me? I saw the notice in the April issue that those who haven't paid their \$10 dues won't receive any more issues, but I paid mine, in the same envelope with the letter you printed in April on page 24 (it even says so in the letter!) If it's just a matter of being busy, I understand perfectly--I haven't even had time to turn on my SOL for about two weeks now. Thanks for your time, and hope to be hearing from you and SOLUS soon. One more thing: does anybody have any information or experiences with regard to the Dynabyte 32K static memory board and a SOL system? I would like to see something about this if anyone has tried this combination.

Sincerely,

John Osudar

John Osudar

Dear Stan,

I was surprised to have my letters to you featured in SOLUS news. That is what happens when you write to an editor. Some of my comments were somewhat harsh, but deserved, and they apply as well to the Bay Area (the Fountainhead?) which I visited last March.

But I am smarter now, and this is for publication, in 82-character (12/100) format...same as 65 @ 100/100.

First, I am writing this letter on a little cheap text editor that I built for SOL users. It does a nice job making letters look nice, and has tabulators and things like that, and I am going to sell it for \$30 with tape/disk and documentation supplied. I am sending you a complimentary copy for review (editors really make out...like critics). But it has really helped me type letters that look great, and I won't use a typewriter anymore.

ITEM: I did relocate my N* boot - to B000. My original idea to put both the boot and DOS in the same 4K was defeated when I realized that the DOS needs 2.5K above it for things like initializing disks, etc., and changing all the other stuff, like the N* Basic, would be a bother. So my DOS is still at 2000, and other programs still start at 2A00. But now that the boot is tucked under SOLUS, I have the top 12K for ALSB, and that is one neat assembler. It is so good, that I will offer to assemble this text editor to any location free to those who refer to this letter in SOLUS (never stop doing business!)

ITEM: I bought a Seattle Computer Products board and double-addressed it according to the directions given by Rod Brock in his article in the 4/78 issue of SOLUS. It has worked like a charm, and is the thing to do for all SOL/N* users. It is too late to buy it at the \$325 price, but even at \$375 it is a whale of a bargain. I am still having trouble with a 16KRA board that ProcTec white wired all over the place and still unloads my program occasionally. The Seattle board that the Retail Computer Store lent me worked fine, and I'm sorry to have my more expensive 16KRA back.

ITEM: I have finally ripped off my cover, placed a small fan behind the works, and that way keep from overheating. Eventually I will buy a little whisper fan to keep things cool, that I can mount right in the back panel. I would feel better if ProcTec would not act as though there weren't any problem at all. My letter to them was published in the last issue of SOLUS, and I wish I had saved their reply: it was written by a secretary who said that the engineer "had told her" that I should check my power supply because I might need a bucking transformer. I have never before dealt with a company that advertised its products for commercial use (ProcTec does...in Interface Age, at least) where I had to deal with second-hand word-of-mouth correspondence. I hope that company shapes up, because the SOL is too good a machine to be let die because of idiot management. These people have to realize that they, and many like them, are out of the kitchen-shop era, and they will be expected to perform and compete with the biggies... As important as intelligence and invention are, they won't cover the lack of sense in the front office.

Enough of my and my soapbox. Along with my little editor, I am sending, for publication, a copy of my program "HANGPERSON" in N* Basic. It is fun and harmless, and non-sexist, too.

Meanwhile, best wishes to you all. I cannot take time to start a Seattle Branch club, but anyone who wants to can give me a call at (206) 479-3535.

Best wishes.

Chuck Bolinger

11

12

```

10 REM      PROGRAM NAME\ HANGPERSON
20 REM      FUNCTION\ Provides skill-guessing game for two
30 REM      players, along the lines of "Hangman"
40 REM
50 REM      WRITTEN IN NORTH STAR BASIC
60 REM
70 REM
80 PRINT CHR$(11)
90 FILL 51211,5
100 PRINT TAB(25),"HANGPERSON"
110 PRINT TAB(22),"For two players ----"
120 PRINT TAB (50),"COPYRIGHT 1978"
130 PRINT TAB (44),"Charles W. Bollinger"
140 PRINT\PRINT\PRINT
150 REM
160 DIM U$(15),L$(1),A$(15),E$(15),Y$(1),C$(15)
170 REM  RESTART HERE
180 PRINT"First player input word of 15 letters or less"
190 PRINT "(Screen will blank when carriage return is pushed)"
200 PRINT
210 C=0\H$=""\C$=""
220 INPUT W$
230 PRINT CHR$(11)
240 FOR X=1 TO LEN (W$)
250   A$(X,X)="-"
260 NEXT
270 PRINT A$
280 REM  "AGAIN" IS HERE!
290 INPUT Give a letter: ".L$
300 F=0\C=C+1
310 FOR X=1 TO LEN (W$)
320   IF L$=A$(X,X)THEN EXIT 430
330   IF L$<>U$(X,X)THEN 350
340   A$(X,X)=L$\F=1
350 NEXT
360 G=0
370 FOR X=1 TO LEN(A$)
380   IF A$(X,X)<>"-" THEN 400
390   G=1
400 NEXT
410 IF G<>1 THEN 700
420 GOTO 440
430 PRINT"You have used that,try again"\GOTO 290
440 IF F=1 THEN 480
450 C$(C,C)=L$
460 L=LEN(H$)+1
470 ON L GOTO 580,590,600,610,620,630,640,650,660,670
480 REM   THIS IS "RITO!"
490 PRINT "GOOD!  ",A$\PRINT\PRINT
500 INPUT "Do you know the word? ".Y$
510 PRINT\PRINT
520 IF Y$<>"Y" THEN 280
530 PRINT
540 INPUT "UHA, IS THE WORD?",E$
550 IF E$=W$ THEN 700
560 PRINT "Sorry, that's not it."
570 GOTO 280

```

```

580 H$="H"\GOTO 850
590 H$="HA"\GOTO 850
600 H$="HAN"\GOTO 850
610 H$="HANG"\GOTO 850
620 H$="HANGP"\GOTO 850
630 H$="HANGPE"\GOTO 850
640 H$="HANGPER"\GOTO 850
650 H$="HANGPERS"\GOTO 850
660 H$="HANGPERSO"\GOTO 850
670 H$="HANGPERSON"
680 PRINT CHR$(11)
690 FOR Y=: TO 8
700   PRINT TAB(28),H$
710 NEXT
720 F=F+1\IF F<150 THEN 720 ELSE 730
730 PRINT\PRINT\PRINT
740 PRINT "The word was  ",U$\PRINT
750 A$=""
760 INPUT "Do you want to try again? ",Y$
770 IF Y$="Y" THEN 170 ELSE 920
780 IF LEN (H$)>4 THEN 800
790 PRINT "OUTSTANDING!"\GOTO 890
800 IF LEN (H$)>7 THEN 820
810 PRINT "VERY GOOD!"\GOTO 890
820 PRINT "NOT BAD"\GOTO 890
830 PRINT "Barely made it!"
840 GOTO 890
850 PRINT CHR$(11)
860 PRINT"No, that's not in there",TAB (45),H$
870 PRINT\PRINT A$, TAB (20),C$
880 GOTO 280
890 REM   THIS IS "REVEAL"
900 PRINT\PRINT
910 GOTO 720
920 FILL 51211,0
930 PRINT
940 PRINT "Thank you.....so long!"
950 END

```

8 JUNE 1978
PLAYA DEL REY

DEAR SOLOS:

I HAVE HAD MY SOL-20 FOR ABOUT A YEAR NOW. DURING THIS TIME IT HAS GIVEN ME VERY GOOD SERVICE. BESIDES A SUPERSCOPE C-104 CASSETTE RECORDER (ON WHICH I FIND MAXELL UD WORKS VERY WELL), A SANYO UM 4092 9" MONITOR, AND A LA-36 DECRITER; I HAVE A SPACEBYTE 16K STATIC MEMORY BOARD INSTALLED.

I FOUND A PATTERN SENSITIVE TMS-4044 CHIP ON THE SPACEBYTE BOARD. IT HAS BEEN REPLACED AND NOW STORAGE IS SOLID AS A ROCK. ONCE I BLEW A SET OF 8T97 BUS DRIVERS BECAUSE THE SPACEBYTE BOARD DID NOT SEAT FAR ENOUGH INTO THE BACKPLANE SOCKET TO BE SELF-ALIGNING. THE MALE EDGE CONNECTOR WAS ABOUT 1/8" SHORTER THAN MANY OTHER S-100 TYPE BOARDS. I FILED THE FILLETS OUT OF THE CORNERS WHERE THE BODY OF THE BOARD MEETS THE EDGE CONNECTOR AND NOW THE BOARD SEATS VERY WELL.

TROUBLE WAS ENCOUNTERED WHEN THE LA-36 WAS TIED TO THE SOL-20 SERIAL INTERFACE. THE PLUG ON THE DECRITER MUST BE CHANGED AND THERE IS NO WIRING INFORMATION IN THE LA-36/35 USER MANUAL. PHONE CALLS WERE MADE TO THE DISTRIBUTOR AND THE BYTE SHOP OF LAWNDALE (WHERE I BOUGHT MY SOL-20). EACH GAVE A DIFFERENT FUNCTION FOR THE FOUR COLOR CODED WIRES. IT TURNED OUT THAT THE BYTE SHOP WAS RIGHT!! EVEN THEN THE INPUT CHANNEL DID NOT FUNCTION ALTHOUGH THE OUTPUT TO THE PRINTER WAS FLAWLESS AT 300 BAUD. SOME CONSIDERABLE TIME LATER THE PROBLEM WAS TRACED TO THE VALUE OF R29 (10K). THIS IS TOO HIGH TO SUPPLY THE INPUT CURRENT REQUIREMENTS OF THE 1489A USED AS U38. BY THE WAY, THE PINOUTS FOR THE 1489A ON PAGE AV-1 (APPENDIX V) ARE ALL WRONG. THE SCHEMATIC PINOUTS ARE CORRECT, HOWEVER. R29 MUST BE LOWERED ENOUGH TO PULL THE VOLTAGE DURING A SPACE ABOVE THE R-232 POSITIVE THRESHOLD OF APPROX. +3.0V. I FOUND THE EASIEST WAY TO DO THIS WITHOUT CHANGING THE LOAD AS SEEN BY A R-232 DEVICE CONNECTED TO THE SERIAL CHANNEL WITH THE LA-36 DISCONNECTED WAS TO WIRE A 3.3K 1/8W RESISTOR BETWEEN PIN 20 AND PIN 3 OF THE MALE PLUG CONNECTING THE DECRITER TO J-1.

TO SUMMARIZE THE P-1 CONNECTIONS FROM A LA-36 DECRITER THE FOLLOWING ARE NEEDED:

L	WHITE	KB NEG.	12	S
A	BLACK	KB POS.	1	0
'	GREEN	PRINT POS.	11	L
3	RED	PRINT NEG.	7	'
6		JUMPER	23	2
		JUMPER	13	0
		13.3K	20	
		1/8WJ	3	

NOW TO THE SOFTWARE WHICH IS THE REAL REASON FOR MY WRITING. I TIRED RATHER EARLY WHILE WAITING FOR PROCESSOR TECH TO GET THE SOLOS VERSION OF ALS-8 OUT. THEREFORE I BOUGHT THE PAPER TAPE VERSION OF THE TYCHON CO-RESIDENT EDITOR ASSEMBLER. A FRIEND LOANED THE USE OF A SOL-20/ASR-33 COMBO AND I SOON HAD A CUTS CASSETTE OF THE TEA. TYCHON'S DOCUMENTATION DESCRIBED THEIR I/O REQUIREMENTS SO THAT I WAS ABLE TO MAKE EVERYTHING SOLOS COMPATIBLE. THE MOST DIFFICULT PART WAS THE USE OF THE SOLOS BYTE READ AND WRITE SUBROUTINES TO OPEN AND CLOSE CASSETTE RECORDS SO THE TYCHON PROGRAM THOUGHT IT WAS WORKING WITH AN ASR-33 PUNCH AND READER. THIS LETTER IS BEING WRITTEN OVER SEVERAL SESSIONS USING THE FINAL RESULT. I ALSO MAINTAIN A 225 NAME MAILING LIST FOR MY CHURCH USING THE SAME PROGRAM. OBVIOUSLY I ALSO USE IT FOR MACHINE LANGUAGE ASSEMBLY WORK.

MY IMPATIENCE WITH PROCESSOR TECH OVER THE DELAY IN GETTING AN EXTENDED BASIC LED TO A SIMILAR PROBLEM. I BROUGHT A COPY OF MSA BASIC. THIS PROGRAM HAD ALMOST ALL THE FEATURES I WANTED. IN FACT IT HAS ONLY TWO DEFECTS OF ANY CONSEQUENCE. FIRST, IT DOES NOT SUPPORT A "BYE" COMMAND. I SOLVED THIS BY THE FOLLOWING PATCH:

```
EN 55C
IFE 1B CA 04 C0/
```

THE RESULT IS THAT THE "ESC" KEY IS RECOGNIZED AS "BYE" WHENEVER THE KEYBOARD IS ACTIVE. OBVIOUSLY YOU CAN USE A KEYBOARD RESET (UPPERCASE & REPEAT) TO RETURN TO SOLOS COMMAND MODE.

THE SECOND SHORTCOMING IS MORE SERIOUS. THE LOAD AND SAVE COMMANDS USE SOLOS IN AN UNRELIABLE WAY. FOR EXAMPLE; THERE IS NO HEADER, THEREFORE SOLOS CANNOT CATALOG THE FILES, THERE 'PROBABLY' ISN'T ENOUGH PREFACE BYTES TO ALLOW THE PHASE-LOCK LOOP TO READ THE BEGINNING OF THE FILE, THERE IS ONLY 26 DIFFERENT FILE NAMES ALLOWED. THE PREFACE BYTE PROBLEM MEANT I COULD RECOVER A SAVED FILE ONE OUT OF SIX OR TEN TIMES. THE OBVIOUS SOLUTION WAS TO MODIFY THE TYCHON CASSETTE DRIVER I HAD WRITTEN TO DO THE SAME FOR MSA BASIC. THE RESULTS ARE SHOWN IN THE ATTACHED ASSEMBLY LISTING AND HEX DUMP.

THIS PROGRAM REQUIRES THE FOLLOWING PATCH TO MSA BASIC:

```
EN 1141
I7C CB 1150:FC CA/
```

WHENEVER THE SAVE (OR LOAD) COMMANDS ARE GIVEN THE DRIVER WILL CLEAR THE CRT SCREEN AND PROMPT WITH THE QUESTION, "PROGRAM NAME ? ". THE CORRECT RESPONSE IS ANY FIVE CHARACTER NAME YOU WISH. THE CURSOR CONTROLS MAY BE USED FOR CORRECTING THE NAME ON THE CRT. REMEMBER, ONLY THE FIRST FIVE CHARACTERS AFTER THE SPACE FOLLOWING THE ? WILL BE TRANSFERED TO THE HEADER. EXAMPLES OF CORRECT NAMES

13

14

ARE:

PROGRAM NAME ? QUBIC
 PROGRAM NAME ? WUMPS
 PROGRAM NAME ? TT6
 PROGRAM NAME ? CAPITAL

THE LAST ONE WILL APPEAR ON THE TAPE AS CAPIT. REMEMBER ALSO THAT THE LETTER SURROUNDED BY QUOTES (I.E. "W" OR "Q" ETC.) MUST STILL BE A PART OF THE SAVE AND LOAD COMMANDS. WHICHEVER LETTER IS USED ON SAVE MUST BE USED ON LOAD AS WELL AS THE SAME PROGRAM NAME.

ALTHOUGH SOMEONE ELSE MIGHT WRITE A SIMPLER PROGRAM, AT LEAST THIS ONE WORKS. USING MSA BASIC IS NOW A JOY. IT HAS ALMOST ALL OF THE FUNCTIONS (WITH THE EXCEPTION OF THE MAT FUNCTIONS) OF THE NEW PROCESSOR TECH BASIC AND IT ONLY NEEDS 6.2K OF STORAGE!! MY 16K SPACEBYTE BOARD HOLDS FAIRLY COMPLEX BASIC PROGRAMS WITH NO TROUBLE AT ALL.

I AM NOW AT THE CIRCUIT DEBUG STAGE IN THE DESIGN OF AN INTERFACE BOARD TO CONNECT THE S-100 BUS TO A NATIONAL MULTIPLEX 3M CASSETTE DRIVE. WHEN THAT IS DONE, I'LL SEND SOLUS A SCHEMATIC.

IN THE MEANTIME, HAPPY COMPUTING AND KEEP THE NEWSLETTER COMING.

YOURS TRULY,



MELVIN M. DALTON
 PLAYA DEL REY, CA. 90291

CC.
 THE BYTE SHOP OF LAWNDALE

C=

PS. Does not work on arrays. There is no token to indicate end of array data.

M.M.D.

/THE FOLLOWING PROGRAM HAS BEEN WRITTEN BY MELVIN M. DALTON
 /MAY, 1978 TO INTERFACE MSA BASIC WITH SOLOS CASSETTE ROUTINES.

DW NAMDIS CCH 0FH
 DW FCB1 C8H 55H
 DW AOUT C0H 1CH
 DW SINP C0H 1FH
 DW AINP C0H 22H
 DW CRLF C2H F9H
 DW FOPEN C0H 07H
 DW WBYTE C0H 10H
 DW RBYTE C0H 0DH
 DW FCLOS C0H 0AH
 DW RETRN C0H 04H
 DW SOLSP CBH FDH

/ORIGIN AT BOTTOM OF SOLOS USER RAM.

*CAH C0H

/LOCATION FOR INVERSE COUNT OF ZERDES SENT OR RECEIVED.

CA C0 00 FLAG1, 00H

/SUBROUTINE TO PROMPT, GET NAME FOR HEADER, & OPEN FILE

CA C1 21 FNAME, LXIH
 CA C2 5B MESS1 /"PROGRAM NAME ?"
 CA C3 CB 0
 CA C4 46 OMESS1, MOVBM
 CA C5 23 INXH
 CA C6 AF XRAA
 CA C7 CD CALL /CHAR. OUT TO CRT
 CA C8 1C AOUT
 CA C9 C0 0
 CA CA 78 MOVAB /RESTORE "A" AFTER AOUT
 CA CB FE CPI /TEST FOR END OF MESS1
 CA CC FF FFH
 CA CD C2 JNZ /RPT. UNTIL MESS1 COMP.
 CA CE C4 OMESS1
 CA CF CA 0
 CA D0 E5 PUSHH /SAVE HL FOR START OF HEADER
 CA D1 CD NAMEHD, CALL /GET CHAR FROM INPUT
 CA D2 1F SINP
 CA D3 C0 0
 CA D4 CA JZ /LOOP UNTIL CHAR. PRESENT
 CA D5 D1 NAMEHD
 CA D6 CA 0
 CA D7 47 MOVBA /CHAR. IN "B" FOR SOL
 CA D8 AF XRAA /POINT TO CRT
 CA D9 CD CALL /DISPLAY CHAR.
 CA DA 1C AOUT
 CA DB C0 0
 CA DC 78 MOVAB /RESTORE "A" AFTER AOUT

```

CA DD FE      CPI      /CR IS END OF NAME
CA DE OD      ODH
CA DF C2      JNZ      /GET MORE OF NAME
CA E0 D1      NAMEHD
CA E1 CA      0
CA E2 CD      CALL     /XEQ CRLF
CA E3 F9      CRLF
CA E4 C2      0
CA E5 E1      POPH     /GET START OF HEADER IN HL
CA E6 01      LXIB     /BC POINTS TO NAME IN DISPLAY MEMORY
CA E7 0F      NAMDIS
CA E8 CC      0
CA E9 16      MVID     /D SEEZ FIRST FIVE CHAR. TO HEADER
CA EA 05      OSH
CA EB 0A      HEAD1, LDAXB /GET CHAR.
CA EC 77      MOVMA   /PUT IT IN HEADER
CA ED 23      INXH    /BUMP TO
CA EE 03      INXB    /NEXT CHAR.
CA EF 15      DCRD    /COUNT D
CA F0 C2      JNZ      /DOWN TO ZERO
CA F1 EB      HEAD1
CA F2 CA      0
CA F3 3E      MVIA     /POINT TO TAPE 1
CA F4 01      01H
CA F5 21      LXIH    /POINT TO BEGINNING OF HEADER
CA F6 6C      HEAD
CA F7 CB      0
CA F8 CD      CALL     /CALL FILE OPEN TO SOLOS
CA F9 07      FOPEN
CA FA C0      0
CA FB C9      RET

```

/THIS SUBROUTINE RECORDS ONE BYTE FROM MSA BASIC AND RETURNS.

```

CA FC C5      IOP,   PUSHB  /SAVE
CA FD D5      PUSHD  /ALL
CA FE E5      PUSHH  /REG.'S
CA FF F5      PUSHPSW /AND FLAGS
CB 00 3A      LDA     /CHK. IF FILE OPEN?
CB 01 55      FCB1   /TAPE UNIT ONE
CB 02 C8      0
CB 03 A7      ANAA   /SET FLAGS
CB 04 CC      CZ     /GET NAME & OPEN FILE
CB 05 C1      FNAME
CB 06 CA      0
CB 07 F1      POPPSW /GET CHAR BACK
CB 08 F5      PUSHPSW /SAVE IT AGAIN
CB 09 B7      DRAA   /SET PSW
CB 0A C4      CNZ    /SET FLAG IF NON-ZERO
CB 0B 2C      SETFLG
CB 0C CB      0
CB 0D F1      POPPSW /GET CHAR.
CB 0E F5      PUSHPSW /AND SAVE
CB 0F 47      MOVBA  /BYTE IN B FOR SOL

```

```

CB 10 3E      MVIA
CB 11 01      01H    /POINT TO FILE1
CB 12 CD      CALL     /WRITE BYTE TO FILE
CB 13 10      WBYTE
CB 14 C0      0
CB 15 DA      JC      /ERROR !!
CB 16 4F      ERR2
CB 17 CB      0
CB 18 F1      POPPSW /GET CHAR.
CB 19 F5      PUSHPSW /AND CHECK FOR
CB 1A A7      ANAA   /ZERO ?
CB 1B CC      CZ     /DECREMENT FLAG1
CB 1C 32      DECFLG
CB 1D CB      0
CB 1E C3      JMP
CB 1F 27      RET1
CB 20 CB      0
CB 21 F1      CLOS1, POPPSW /REALIGN STACK
CB 22 3E      MVIA   /POINT TO TAPE 1
CB 23 01      01H
CB 24 CD      CALL     /CLOSE FILE
CB 25 0A      FCLOS
CB 26 C0      0
CB 27 F1      RET1,  POPPSW /GET
CB 28 E1      POPH   /REG.'S
CB 29 D1      POPD   /BACK
CB 2A C1      POPB   /ETC.
CB 2B C9      RET
CB 2C 3E      SETFLG, MVIA /SET FLAG1 TO '3' WHEN TEA SENDS 'C0'
CB 2D 03      03H
CB 2E 32      STA    /RECORD IT!
CB 2F C0      FLAG1
CB 30 CA      0
CB 31 C9      RET
CB 32 3A      DECFLG, LDA /GET
CB 33 C0      FLAG1 /FLAG
CB 34 CA      0
CB 35 3D      DCRA   /DOWN BY ONE
CB 36 32      STA    /PUT IT BACK
CB 37 C0      FLAG1
CB 38 CA      0
CB 39 C0      RNZ   /RETURN IF NOT 3RD ZERO
CB 3A 3A      LDA   /CHECK IF
CB 3B 55      FCB1  /READ OR WRITE
CB 3C C8      0     /FCB1=FE DURING WRITE & FF DURING READ
CB 3D 3C      INRA  /COUNT UP TO ZERO
CB 3E C2      JNZ   /EXIT WHEN WRITE
CB 3F 21      CLOS1
CB 40 CB      0
CB 41 3E      RCLOS, MVIA /POINT TO FILE 1
CB 42 01      01H
CB 43 CD      CALL   /CONTINUE
CB 44 0D      RBYTE /READING
CB 45 C0      0

```

15

16

```

CB 46 DA      JL      /EXIT ON EOF (OR ERROR)
CB 47 4C      ERR1
CB 48 CB      0
CB 49 C3      JMP      /REPEAT AS NEEDED
CB 4A 41      RCLOS
CB 4B CB      0
CB 4C FA      ERR1,   JM      /EOF
CB 4D 21      CLOS1
CB 4E CB      0
CB 4F 06      ERR2,   MVI B  "E"
CB 50 45      XRAA     /CRT PORT
CB 51 AF      CALL     /SOL OUTPUT
CB 52 CD      AOUT
CB 53 1C      0
CB 54 C0      0
CB 55 31      LXISP   /POINT TO SOL STACK
CB 56 FD      SOLSP
CB 57 CB      0
CB 58 C3      JMP      /GO TO SOLOS
CB 59 04      RETRN
CB 5A C0      0

```

/THIS IS THE PROMPT MESSAGE IN ASCII

```

CB 5B 08      MESS1,  0BH   /CLR SCREEN AND HOME CURSOR
CB 5C 50      50H
CB 5D 52      52H
CB 5E 4F      4FH
CB 5F 47      47H
CB 60 52      52H
CB 61 41      41H
CB 62 4D      4DH   /"PROGRAM"
CB 63 20      20H   /SPACE
CB 64 4E      4EH
CB 65 41      41H
CB 66 4D      4DH
CB 67 45      45H   /"NAME"
CB 68 20      20H
CB 69 3F      3FH   /"?"
CB 6A 20      20H
CB 6B FF      FFH   /END OF MESS1

```

/THE NEXT SIXTEEN BYTES ARE RESERVED FOR THE HEADER FOR SOLOS.

```

CB 6C 00      HEAD,   0
CB 6D 00      0
CB 6E 00      0
CB 6F 00      0
CB 70 00      0
CB 71 00      0
CB 72 C2      C2H   / "B" + 80H
CB 73 00      0
CB 74 00      0
CB 75 00      0

```

```

CB 76 00      0
CB 77 00      0
CB 78 00      0
CB 79 00      0
CB 7A 00      0
CB 7B 00      0

```

/THIS SUBROUTINE READS ONE BYTE FROM CASSETTE AND SENDS IT TO MSA

```

CB 7C C5      IOR,    PUSHB  /SAVE
CB 7D D5      PUSHD  /REG.'S
CB 7E E5      PUSHH  /FOR TEA
CB 7F 3A      LDA     /TEST
CB 80 55      FCB1   /IF FILE
CB 81 C8      0       /OPEN
CB 82 A7      ANAA   /SET FLAGS
CB 83 CC      CZ     /IF ZERO
CB 84 C1      FNAME  /THEN
CB 85 CA      0       /OPEN
CB 86 3E      MVI A  /POINT
CB 87 01      01H   /TO FILE ONE
CB 88 CD      CALL   /GET BYTE
CB 89 0D      RBYTE
CB 8A C0      0
CB 8B DA      JC     /READ ERROR OR EOF
CB 8C 4C      ERR1
CB 8D CB      0
CB 8E F5      PUSHPSW /SAVE CHAR.
CB 8F C4      CNZ    /PREPARE TO LOOK FOR THREE ZEROES
CB 90 2C      SETFLG
CB 91 CB      0
CB 92 F1      POPPSW /GET CHAR. BACK
CB 93 F5      PUSHPSW /AND SAVE FOR RETURN
CB 94 CC      CZ     /COUNT ZEROES
CB 95 32      DECFLG
CB 96 CB      0
CB 97 C3      JMP    /RETURN
CB 98 27      RET1
CB 99 CB      0

```

```

AOUT  =C0 1C  AINP  =C0 22  CLOS1  =CB 21  CRLF  =C2 F9
DECFLG =CB 32  ERR1  =CB 4C  ERR2  =CB 4F  FLAG1  =CA C0
FNAME  =CA C1  FCB1  =CB 55  FOPEN  =C0 07  FCLOS  =C0 0A
HEAD1  =CA EB  HEAD  =CB 6C  IOP    =CA FC  IOR    =CB 7C
MESS1  =CB 5B  NAMEHD =CA D1  NAMDIS =CC 0F  OMESS1 =CA C4
RET1   =CB 27  RCLOS  =CB 41  RBYTE  =C0 0D  RETRN  =C0 04
SETFLG =CB 2C  SINP  =C0 1F  SOLSP  =CB FD  WBYTE  =C0 10

```

ERRORS DETECTED = 000

```

CAC0  00 21 5B CB 46 23 AF CD 1C C0 78 FE FF C2 C4 CA
CAD0  E5 CD 1F C0 CA D1 CA 47 AF CD 1C C0 78 FE 0D C2
CAE0  D1 CA CD F9 C2 E1 01 0F CC 16 05 0A 77 23 03 15
CAF0  C2 EB CA 3E 01 21 6C CB CD 07 C0 C9 C5 D5 E5 F5
CB00  3A 55 C8 A7 CC C1 CA F1 F5 B7 C4 2C CB F1 F5 47
CB10  3E 01 CD 10 C0 DA 4F CB F1 F5 A7 CC 32 CB C3 27
CB20  CB F1 3E 01 CD 0A C0 F1 E1 D1 C1 C9 3E 03 32 C0
CB30  CA C9 3A C0 CA 3D 32 C0 CA C0 3A 55 C8 3C C2 21
CB40  CB 3E 01 CD 0D C0 DA 4C CB C3 41 CB FA 21 CB 06
CB50  45 AF CD 1C C0 31 FD CB C3 04 C0 0B 50 52 4F 47
CB60  52 41 4D 20 4E 41 4D 45 20 3F 20 FF 00 00 00 00
CB70  00 00 C2 00 00 00 00 00 00 00 00 00 C5 D5 E5 3A
CB80  55 C8 A7 CC C1 CA 3E 01 CD 0D C0 DA 4C CB F5 C4
CB90  2C CB F1 F5 CC 32 CB C3 27 CB

```

27 June, 1978

Dear Stan:

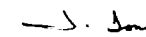
I've contacted P.T. via "ACCESS" about the following problem, and have also submitted the following program. First the buss. If you are running Extended Cassette BASIC and have elected to delete the MATRIX and EXTENDED functions, the following things have happened:

1. Although the manual says you cannot use the SQR(x) function you still can set to the address of the routine, however, your program is probably resident there, so CRASH!
2. Although the manual does not state it, you lose the 'I' function.
3. The RND(x) function comes up with a unique bus in that the number generated will sometimes contain a punctuation mark of varying type.

The revised initialization routine covers problem 1. No more SQR(x), and problem 2. is simply a pen and ink change to the manual. As for bus 3., I have left that to P.T. to find, after all, they aren't paying me to repair thier software.

Keep up the good work.

Yours,


J. Tom

Dear Stan:

This letter is a follow to my previous letter. Eureka, I found it. The bus in Extended Cassette Basic that is. I've called P.T. to pass along what I have found, and outlined how I intended to get around the bus. A true fix will probably require a major revision and reassembly. My fix works and causes the loss of 9 bytes in maximum line length (123 vice 132) but it is better than having the bus. I have enclosed the latest revision of the initialization routine with both object and source code this time.

To correct the bus you must do the followings:

1. Load Basic but do not execute it.
2. Load or enter the revised initialization routine.
3. Make the following entries: (computer prompts shown)


```

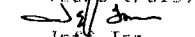
>EN 2DF<cr>
:7B 8E9:7B 27E8:79 1C8B:4C 29 1CBF:53 29<cr>
:294C:03 14 76 21 02 11 32 48 25<cr>
:32E2:00 00 00 00 00 00 00 00 00<cr>
>SA BASIC 0 3F87<cr>

```

I have also included the source code for a driver to support the ALSB "ASSI" commands. I hope someone out there can use it.

Guess that is about it for now.

Yours truly,


Jeff Tom
CSTSC/Code 53
Mare Island CA. 94592

17

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READY
ASSM 3C20

```
0001 *****
0002 * REVISED INITIALIZATION ROUTINE FOR EXTENDED *
0003 * CASSETTE BASIC -- MODIFICATIONS BY JEFF TOM *
0004 * CSTSC/CODE 53, HARE ISLAND, CA. 94592 *
0005 ***** 12 JULY 1978 *****
0006 *
0007     ORG     3C20H
0008 *
0009     PUSH    H
0010     LXI    H,3F83H <==NEW END OF PROGRAM AREA
0011     LXI    D,0000H
0012     XRA    A
0013     PUSH    PSW
0014 L3C29H POP    PSW
0015     MOV    A,H
0016     ADC    E
0017     MOV    E,A
0018     MOV    A,D
0019     ACI    00
0020     MOV    D,A
0021     PUSH    PSW
0022     MOV    A,H
0023     ORA    L
0024     DCX    H
0025     JNZ    L3C29H
0026     POP    PSW
0027     XCHG
0028     SHLD   L3F86H
0029     POP    H
0030     MOV    A,H
0031     STA    04E1H
0032     STA    2658H
0033     STA    267CH
0034     STA    26A5H
0035     STA    26F4H
0036     STA    0587H
0037     STA    269AH
0038     STA    1538H
0039     STA    14F9H
0040     STA    150EH
0041     STA    148FH
0042     STA    1566H
0043     STA    0038H
0044     STA    14BEH
0045     STA    15B9H
0046     STA    09BDH
0047     STA    0A85H
0048     STA    3F11H
0049     STA    3F1EH
```

```
3C78 32 4B 2B 0050 STA 284BH
3C7B 57 0051 MOV D,A
3C7C 1E 1A 0052 MVI E,1AH
3C7E 1A 0053 LDAX D
3C7F 6F 0054 MOV L,A
3C80 13 0055 INX D
3C81 1A 0056 LDAX D
3C82 67 0057 MOV H,A
3C83 22 66 2B 0058 SHLD 2866H
3C86 1E 20 0059 MVI E,20H
3C88 1A 0060 LDAX D
3C89 6F 0061 MOV L,A
3C8A 13 0062 INX D
3C8B 1A 0063 LDAX D
3C8C 67 0064 MOV H,A
3C8D 22 68 2B 0065 SHLD 2868H
3C90 21 EB 29 0066 LXI H,29EBH
3C93 22 EE 29 0067 SHLD 29EEH
3C96 F9 0068 SPHL
3C97 CD 8B 2B 0069 CALL 2B8BH
3C9A CD 71 2B 0070 CALL 2B71H
3C9D 3E 3F 0071 MVI A,3FH
3C9F 32 6D 2B 0072 STA 286DH
3CA2 2A 86 3F 0073 LHLD L3F86H
3CA5 EB 0074 XCHG
3CA6 2A 84 3F 0075 LHLD L3F84H
3CA9 CD 24 2B 0076 CALL 2B24H
3CAC CA CF 3C 0077 JZ L3CCFH
3CAF 21 FE 3E 0078 LXI H,L3FEFH
3CB2 CD 70 26 0079 CALL 2670H
3CB5 CD 0B 2E 0080 CALL 2E0BH
3CB8 2A 84 3F 0081 LHLD L3F84H
3CBB CD 21 3F 0082 CALL L3F21H
3CBE 06 20 0083 MVI B,20H
3CC0 CD 1B 3F 0084 CALL L3F1BH
3CC3 2A 86 3F 0085 LHLD L3F86H
3CC6 CD 21 3F 0086 CALL L3F21H
3CC9 CD 0F 3F 0087 CALL L3F0FH
3CCC CD 70 26 0088 CALL 2670H
3CCF 06 8B 0089 L3CCFH MVI B,8BH
3CD1 CD 1B 3F 0090 CALL L3F1BH
3CD4 CD 70 26 0091 CALL 2670H
3CD7 CD 70 26 0092 CALL 2670H
3CDA 21 68 3E 0093 LXI H,L3E68H
3CDD CD 0B 2E 0094 CALL 2E0BH
3CE0 CD 70 26 0095 CALL 2670H
3CE3 21 93 3E 0096 LXI H,L3E93H
3CE6 CD 0B 2E 0097 CALL 2E0BH
3CE9 CD 70 26 0098 CALL 2670H
3CEC 21 BE 3E 0099 LXI H,L3EBEH
3CEF CD 0B 2E 0100 CALL 2E0BH
3CF2 CD 70 26 0101 CALL 2670H
3CF5 CD 70 26 0102 CALL 2670H
3CF8 CD 70 26 0103 CALL 2670H
```


3CFB CD 70 26	0104	CALL	2670H
3CFE 21 F0 3E	0105	LXI	H,L3EF0H
3D01 CD 0B 2E	0106	CALL	2E0BH
3D04 CD 70 26	0107	CALL	2670H
3D07 21 00 00	0108	LXI	H,0000H
3D0A 22 00 00	0109	SHLD	0000H
3D0D 22 01 00	0110	SHLD	0001H
3D10 21 34 3F	0111	LXI	H,L3F34H
3D13 46	0112	L3D13H MOV	B,M
3D14 3E AA	0113	MVI	A,0AAH
3D16 77	0114	MOV	M,A
3D17 BE	0115	CMP	M
3D18 70	0116	MOV	M,B
3D19 C2 22 3D	0117	JNZ	L3D22H
3D1C 23	0118	INX	H
3D1D 7C	0119	MOV	A,H
3D1E B5	0120	ORA	L
3D1F C2 13 3D	0121	JNZ	L3D13H
3D22 2B	0122	L3D22H DCX	H
3D23 22 0A 09	0123	SHLD	090AH
3D26 21 D8 3D	0124	LXI	H,L3D83DH
3D29 CD 0B 2E	0125	CALL	2E0BH
3D2C 2A 0A 09	0126	LHLD	090AH
3D2F CD 21 3F	0127	CALL	L3F21H
3D32 CD 70 26	0128	L3D32H CALL	2670H
3D35 21 3A 3E	0129	LXI	H,L3E3AH
3D38 CD 0B 2E	0130	CALL	2E0BH
3D3B 2A 0A 09	0131	LHLD	090AH
3D3E 23	0132	INX	H
3D3F CD 40 3F	0133	CALL	L3F40H
3D42 2B	0134	DCX	H
3D43 EB	0135	XCHG	.
3D44 2A 0A 09	0136	LHLD	090AH
3D47 CD 24 2B	0137	CALL	2B24H
3D4A DA 4E 3D	0138	JC	L3D4EH
3D4D EB	0139	XCHG	.
3D4E 11 FF 3F	0140	L3D4EH LXI	D,3FFFH
3D51 CD 24 2B	0141	CALL	2B24H
3D54 DA 32 3D	0142	JC	L3D32H
3D57 22 0A 09	0143	SHLD	090AH
3D5A 22 69 2E	0144	SHLD	2E69H
3D5D CD 70 26	0145	CALL	2670H
3D60 21 01 3E	0146	L3D60H LXI	H,L3E01H
3D63 CD 0B 2E	0147	CALL	2E0BH
3D66 CD 0F 3F	0148	CALL	L3F0FH
3D69 F5	0149	PUSH	PSW
3D6A CD 70 26	0150	CALL	2670H
3D6D F1	0151	POP	PSW
3D6E FE 59	0152	CPI	59H
3D70 CA 7B 3D	0153	JZ	L3D7BH
3D73 FE 4E	0154	CPI	4EH
3D75 CA D2 3D	0155	JZ	L3DD2H
3D78 C3 60 3D	0156	JMP	L3D60H
3D7B 21 9A 34	0157	L3D7BH LXI	H,349AH

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3D7E 36 0D	0158	MVI	M,0DH
3D80 23	0159	INX	H
3D81 22 65 2E	0160	SHLD	2E65H
3D84 22 67 2E	0161	SHLD	2E67H
3D87 21 F0 29	0162	LXI	H,29F0H
3D8A 22 FE 04	0163	SHLD	04FEH
3D8D 21 1D 3E	0164	L3D8DH LXI	H,3E1DH
3D90 CD 0B 2E	0165	CALL	2E0BH
3D93 CD 0F 3F	0166	CALL	L3F0FH
3D96 F5	0167	PUSH	PSW
3D97 CD 70 26	0168	CALL	2670H
3D9A F1	0169	POP	PSW
3D9B FE 59	0170	CPI	59H
3D9D CA A8 3D	0171	JZ	L3DABH
3DA0 FE 4E	0172	CPI	4EH
3DA2 CA D2 3D	0173	JZ	L3DD2H
3DA5 C3 8D 3D	0174	JMP	L3D8DH
3DAB 21 6B 2E	0175	L3DABH LXI	H,2E6BH
3DAB 36 0D	0176	MVI	M,0DH
3DAD 23	0177	INX	H
3DAE 22 67 2E	0178	SHLD	2E67H
3DB1 22 65 2E	0179	SHLD	2E65H
3DB4 21 F0 29	0180	LXI	H,29F0H
3DB7 22 65 05	0181	SHLD	0565H
3DBA 22 74 05	0182	SHLD	0574H
3DBD 22 7A 05	0183	SHLD	057AH
3DC0 22 7D 05	0184	SHLD	057DH
3DC3 22 83 05	0185	SHLD	0583H
3DC6 22 80 05	0186	SHLD	0580H
3DC9 22 77 05	0187	SHLD	0577H
3DCC 22 44 05	0188	SHLD	0544H
3DCF 22 68 05	0189	SHLD	0568H
3DD2 CD A1 06	0190	L3DD2H CALL	06A1H
3DD5 C3 03 00	0191	JMP	0003H
3DD8 4C 41 53 54	0192	L3DD8H ASC	#LAST AVAILABLE MEMORY LOCATION (HEX) IS *#
20 41 56 41			
49 4C 41 42			
4C 45 20 4B			
45 4D 4F 52			
59 20 4C 4F			
43 41 54 49			
4F 4E 20 28			
48 45 58 29			
20 49 53 20			
22			
3E01 44 45 4C 45	0193	L3E01H ASC	#DELETE MATRIX OPERATIONS? *#
54 45 20 4B			
41 54 52 49			
58 20 4F 50			
45 52 41 54			
49 4F 4E 53			
3F 20 20 22			
3E1D 44 45 4C 45	0194	L3E1DH ASC	#DELETE EXTENDED FUNCTIONS? *#
54 45 20 45			

2 (1)

```

58 54 45 4E
44 45 44 20
46 55 4E 43
54 49 4F 4E
53 3F 20 20
22
3E3A 47 49 56 45      0195 L3E3AH ASC      #GIVE FIRST PROTECTED MEMORY LOCATION (HEX): **
20 46 49 52
53 54 20 50
52 4F 54 45
43 54 45 44
20 4D 45 4D
4F 52 59 20
4C 4F 43 41
54 49 4F 4E
20 28 48 45
58 29 3A 20
20 22
3E68 20 20      0196 L3E68H DW      2020H
3E6A 20 20      0197          DW      2020H
3E6C 20 20      0198          DW      2020H
3E6E 20 20      0199          DW      2020H
3E70 20 20      0200          DW      2020H
3E72 20 20      0201          DW      2020H
3E74 20 20      0202          DW      2020H
3E76 20 20      0203          DW      2020H
3E78 50 72 6F 63  0204          ASC      #Processor Technology Corp.**
65 73 73 6F
72 20 54 65
63 68 6E 6F
6C 6F 67 79
20 43 6F 72
70 2E 22
3E93 20 20      0205 L3E93H DW      2020H
3E95 20 20      0206          DW      2020H
3E97 20 20      0207          DW      2020H
3E99 20 20      0208          DW      2020H
3E9B 20 20      0209          DW      2020H
3E9D 20 20      0210          DW      2020H
3E9F 20 20      0211          DW      2020H
3EA1 20 20      0212          DW      2020H
3EA3 45 78 74 65  0213          ASC      #Extended BASIC Revision A**
6E 64 65 64
20 42 41 53
49 43 20 20
52 65 76 69
73 69 6F 6E
20 41 22
3EBE 20 20      0214 L3EBEH DW      2020H
3EC0 20 20      0215          DW      2020H
3EC2 20 20      0216          DW      2020H
3EC4 20 20      0217          DW      2020H
3EC6 20 20      0218          DW      2020H
3EC8 43 4F 50 59  0219          ASC      #COPYRIGHT (C) 1977 ALL RIGHTS RESERVED**

```

```

52 49 47 48
54 20 28 43
29 20 31 39
37 37 20 20
41 4C 4C 20
52 49 47 48
54 53 20 52
45 53 45 52
56 45 44 22
3EF0 53 49 5A 49      0220 L3EF0H ASC      #SIZING MEMORY**
4E 47 20 4D
45 4D 4F 52
59 22
3EFE 43 48 45 43      0221 L3EFEH ASC      #CHECKSUM FAILED **
48 53 55 4D
20 46 41 49
4C 45 44 20
22
3F0F CD 1F C0      0222 L3F0FH CALL      0C01FH
3F12 CA 0F 3F      0223          JZ      L3F0FH
3F15 E6 7F      0224          ANI      7FH
3F17 47      0225          MOV      B,A
3F18 FE 0D      0226          CPI      0DH
3F1A C8      0227          RZ
3F1B F5      0228 L3F1BH PUSH      PSW
3F1C CD 19 C0      0229          CALL     0C019H
3F1F F1      0230          POP      PSW
3F20 C9      0231          RET      .
3F21 06 04      0232 L3F21H MVI      B,04H
3F23 C5      0233 L3F23H PUSH      B
3F24 AF      0234          XRA      A
3F25 29      0235          DAD      H
3F26 17      0236          RAL      .
3F27 29      0237          DAD      H
3F28 17      0238          RAL      .
3F29 29      0239          DAD      H
3F2A 17      0240          RAL      .
3F2B 29      0241          DAD      H
3F2C 17      0242          RAL      .
3F2D FE 0A      0243          CPI      0AH
3F2F DA 34 3F      0244          JC      L3F34H
3F32 C6 07      0245          ADI      7
3F34 C6 30      0246 L3F34H ADI      30H
3F36 47      0247          MOV      B,A
3F37 CD 1B 3F      0248          CALL     3F1BH
3F3A C1      0249          POP      B
3F3B 05      0250          DCR      B
3F3C C2 23 3F      0251          JNZ      L3F23H
3F3F C9      0252          RET      .
3F40 E5      0253 L3F40H PUSH      H
3F41 21 00 00      0254 L3F41H LXI      H,0000H
3F44 CD 0F 3F      0255 L3F44H CALL      L3F0FH
3F47 FE 0D      0256          CPI      0DH
3F49 CA 73 3F      0257          JZ      L3F73H

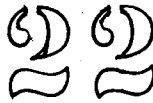
```

3F4C D6 30	0258	SUI	30H
3F4E DA 79 3F	0259	JC	L3F79H
3F51 FE 0A	0260	CPI	0AH
3F53 DA 58 3F	0261	JC	L3F58H
3F56 D6 07	0262	SUI	07H
3F58 FE 10	0263	L3F58H CPI	10H
3F5A D2 79 3F	0264	JNC	L3F79H
3F5D 29	0265	DAD	H
3F5E DA 79 3F	0266	JC	L3F79H
3F61 29	0267	DAD	H
3F62 DA 79 3F	0268	JC	L3F79H
3F65 29	0269	DAD	H
3F66 DA 79 3F	0270	JC	L3F79H
3F69 29	0271	DAD	H
3F6A DA 79 3F	0272	JC	L3F79H
3F6D CD 6B 06	0273	CALL	066BH
3F70 C3 44 3F	0274	JMP	L3F44H
3F73 7C	0275	L3F73H MOV	A,H
3F74 B5	0276	ORA	L
3F75 D1	0277	POP	D
3F76 C0	0278	RNZ	
3F77 EB	0279	XCHG	.
3F78 C9	0280	RET	.
3F79 06 3F	0281	L3F79H MVI	B,3FH
3F7B CD 1B 3F	0282	CALL	L3F1BH
3F7E CD 70 26	0283	CALL	2670H
3F81 C3 41 3F	0284	JMP	L3F41H
3F84 71 9A	0285	L3F84H DW	9A71H <==NEW EXPECTED CHECKSUM
3F86 00 00	0286	L3F86H DW	0000H ACTUAL CHECKSUM STORED HERE
READY			

```

0001 * THESE ROUTINES ARE DESIGNED TO BE USED WITH THE SOLOS
0002 * MONITOR, AND ALSO ASSEMBLER. ALL REFERENCES TO EITHER
0003 * OF THESE PROGRAMS ARE LISTED IN THE EQUATE TABLE BELOW.
0004 * THE CARRY FLAG IS USED AS A FLAG TO INDICATE AN ERROR
0005 * AND CAUSES THE "WHAT?" MESSAGE TO BE OUTPUT. A SOURCE
0006 * FILE MUST END WITH THE "END" PSEUDO OP. AN OPEN FILE
0007 * MUST BE CLOSED BY SEPARATE COMMAND AFTER AN ASSEMBLY.
0008 *
0009 * JEFF TOM, CSTSC/CODE 53, MARE ISLAND CA. 94592
0010 *
0011 FOPEN EQU 0C007H
0012 FCLOS EQU 0C00AH
0013 RDBYT EQU 0C00DH
0014 WRBYT EQU 0C010H
0015 SINP EQU 0C01FH
0016 BOFP EQU 0D005H
0017 SWCH1 EQU 0D0FDH
0018 IBUF EQU 0D1E4H
0019 SCRN EQU 0E380H
0020 WHAT EQU 0E7DDH
0021 UNIT EQU 1 MAY BE 1 OR 2 DEPENDING ON YOUR SYSTEM SETUP
0022 *
0023 * THIS ROUTINE WILL READ A BYTE FORMAT CASSETTE AND
0024 * PASS A FILE ONE LINE AT A TIME FOR USE WITH THE "ASSI"
0025 * ASSEMBLER COMMAND. MAKE IT AN INPUT DRIVER
0026 CREAD LDA SWCH1
0027 ORA A
0028 JNZ TLOOP
0029 INR A
0030 STA SWCH1
0031 LXI H,HEADR
0032 CALL OPNOP
0033 JC WHAT
0034 *
0035 * PROGRAM JUMPS HERE TO READ THE FIRST BYTE IN A LINE
0036 * IF THE BYTE IS A ONE WE GO TO REWIND, IF NOT WE
0037 * FALL THROUGH TO READ THE REST OF THE LINE
0038 TLOOP CALL RDBYT
0039 JC WHAT
0040 CPI 1 EOF?
0041 JZ REWIND YES, THEN REWIND TAPE FOR NEXT PASS
0042 LXI H,IBUF-5 INPUT BUFFER LOCATION FOR NUMBERED LINES
0043 *
0044 * THIS ROUTINE GETS DATA ONE BYTE AT A TIME FROM THE SOLOS
0045 * BUFFER AREA UNTIL IT FINDS A <CR>.
0046 RLOOP MVI A,UNIT
0047 PUSH H
0048 CALL RDBYT
0049 JC WHAT
0050 POP H
0051 MOV M,A
0052 CPI 0DH A <CR>?
0053 RZ YES, PASS LINE TO ALSB

```



```
0054     INX     H     ELSE...
0055     JMP     RLOOP GET NEXT BYTE
0056 *
0057 * THIS ROUTINE CLOSSES A FILE, PRINTS A MESSAGE, THEN WAITS
0058 * FOR YOU TO TYPE IN ANY KEY TO INDICATE THAT YOU'RE SET
0059 * UP TO REWIND. THIS ROUTINE IS ENTERED BETWEEN PASS 1
0060 * AND PASS 2 OF THE ASSEMBLER, OR FOR EACH SYMBOL IF YOU
0061 * ARE DOING AN ASSIX.
0062 REWIND CALL    TOFF
0063     XRA     A
0064     STA     SWCH1
0065     LXI     H,RMESS
0066     CALL    SCRIN
0067 WAIT  CALL    SINP
0068     JZ     WAIT
0069     JMP     CREAD
0070 *
0071 * THIS SHOULD BE MADE A CUSTOM COMMAND TO CLOSE FILE AFTER
0072 * ASSEMBLY. ALSO STOPS ASSEMBLY WHEN IT SEES THE "END"
0073 * PSEUDO OP, AND NEVER CLOSSES THE FILE.
0074 TOFF  MVI     A,UNIT
0075     JMP     FCLOS
0076 ******
0077 * THIS ROUTINE WRITES THE CURRENT FILE ON TAPE IN THE
0078 * BYTE FORMAT FOR USE WITH CREAD. MAKE THIS ROUTINE
0079 * AN OUTPUT DRIVER
0080 CLIST MVI     A,UNIT
0081     LXI     H,HEADR
0082     CALL    OPNOP OPEN CASSETTE FILE
0083     JC     WHAT
0084     LHLD   BOFP BEGINNING OF SOURCE FILE POINTER
0085 WLOOP MVI     A,UNIT
0086     MOV     B,M
0087     INX     H
0088     PUSH   H
0089     PUSH   B
0090     CALL   WRBYT
0091     JC     WHAT
0092     POP    B
0093     POP    H
0094     MOV     A,B
0095     CPI     1
0096     JNZ    WLOOP
0097     MVI     A,UNIT
0098     JMP     FCLOS
0099 OPNOP CALL    FOPEN
0100     RET
0101 RMESS ASC    'REWIND TAPE'
0102     DB     13
0103 HEADR ASC    'CLIST'
0104     DB     0
0105     DB     'S'
0106     DW     256
0107     DW     0
```

```
0108     DW     0
0109     DW     0
0110     DB     0
0111     COM    TOFF
0112     COM    CLIST
0113     END
```

Joseph A. Maguire
1-72 Horinouchi
Yokohama, Japan 233

August 20, 1978

Dear Stan,

Please, please do whatever is necessary to keep SOLUS NEWS up to it's excellent standards. I know it's tough publishing a newsletter but if paid help is required to get it done, in my opinion, it's worth it. I would gladly pay an increased amount in dues for that purpose. One issue of Solus News contains as much information as a dozen phone calls or letters to PTC and, at the long distance rates I have to pay, it's a bargain.

Suggestion: I keep my copies of Solus News in a three ring binder. The last issue is driving me nuts because I must continuously rotate the binder as I read from page to page. Please go back to the format you used in the April issue. Thanks.

Thanks for the clarification about HELIUM. I will continue to pass all my Helios tidbits along to Solus News.

HELIOS NOTES:

Stuck Disk Pressing the eject button failed to eject the disk from the Persol drive. The disk was firmly stuck in there even though I could hear whirring noises when I pressed the button. Removing the cover disclosed that the plastic hub was not retracting from the spindle collar where it holds the disk. The hub is a very precise fit and the least misalignment will cause it to jam. The problem was the three-toothed retaining washer which holds the hub shaft to the retractor plate. Certain positions of the washer will shift the alignment of the hub enough to cause it to jam. Rotating the washer to a new position fixed the problem - for awhile.

Garbaged Directory As has probably been discovered by many by now, the 16KRA and Helios are not exactly compatible. The DMA action of Helios sometimes interferes with the refresh of the 16KRA and intermittent memory failures can result. Sure enough, when I was saving a new file and PTDOS was updating the directory - crash! This is the worst possible place for a failure to occur (Murphy's law!) since now none of the files on the disk are accessible. Every attempt to read the disk results in a DISK STRUCTURE BAD error when PTDOS tries to read the directory. And, of course, the directory track is RECOVER protected (Murphy's corollary) so it can't be salvaged. My real gripe is that PTC, in trying to protect us from ourselves, purposely did not include disk primitive commands in PTDOS. I know where the files are on the disk (I have a printout of the FILES before the crash) and if I could read a particular track and sector into memory I could save the file again on another disk. But, alas, PTDOS does not allow this. If some Solus member has written a routine to do this I would dearly like to see it.

Note: PTC has announced update 731071 (change J) for Helios to correct the 16KRA incompatibility problem. I highly recommend it!

SOL NOTES:

ALS8 I tried relocating ALS8 with the information given by John Osudar in Vol. 1, #3 Solus News but it didn't work. The problem was the stack. After relocation to low memory I removed the memory in the D000 to FFFF area and the relocated ALS8 kept crashing. Seems the ALS8 uses the stack in the FFF0 area even in the relocated version. Taking out the memory in that area of course, caused it to blow up. Cure: use a LXI,SP ____ near the initial entry point to set the stack pointer to a usable memory area. Note to John: Your article saved me many hours of searching through the ALS8 code to find the data areas. Thanks very much.

North Star JP I found the reason why much of my PTC software blows up when trying to access it from the North Star DOS with the JP command. It seems that PTC software likes to save the contents of the HL register on entry in order to properly set the I/O drivers to be compatible with SOLOS or CUTER. When entering from SOLOS, HL contains C000 but from the NS DOS it is something else. This something else messes up the I/O routine and it doesn't work. Fix: Enter a few bytes before the normal entry point and set HL to C000. Make this the new start address in your NS disk file.

Heat Problem For those suffering from heat problems who don't want to out holes in their pretty blue covers for an extra fan, here is another approach. Heat is a byproduct of power consumption. The Sol is essentially a big resistor. It takes in power from the AC line and converts it to heat. A typical Sol uses about 120 watts. (120V x 1 Amp) All of this heat is gotten rid of by either radiation (the cabinet feels warm) or convection. (air cooling) The cabinet is of finite size and the fan is only large enough for a limited amount of heat dissipation. If neither is to be changed then the only alternative is to reduce the input power. This can be done by using low power memory boards (dynamic memory is most noted for low power) or reducing the input voltage. A microcomputer is a DC machine. As long as the required DC operating voltages are present it could care less what AC voltage is available at the wall socket. But a reduction of AC input voltage to the point where the minimum DC is available to the regulators will have a dramatic effect on the amount of heat produced. Experience here in Japan, where the standard AC power is 100 volts and 50 Hertz, has shown that the Sol is fully capable of normal operation at this level. The +8VDC line from the power supply is the one which gets the heaviest demand. Measurements on a Sol with 120 VAC input show this line to average around 10 VDC, a full 2.5 Volts above the minimum required. Some early Sols developed as much as 14 Volts on this line but hopefully all of these have been corrected. In some areas of the United States, particularly those with a high air conditioning load, the AC voltage may measure as high as 130 Volts at times. This can really play havoc with the Sol heat problem. If you want to try lowering the AC input voltage, here's how:

1. Measure the unregulated DC voltages at the backplane connector. The minimum for the 16V lines is 15 Volts and for the 8V line is 7.5 Volts.
2. Measure the AC voltage available at the wall socket.

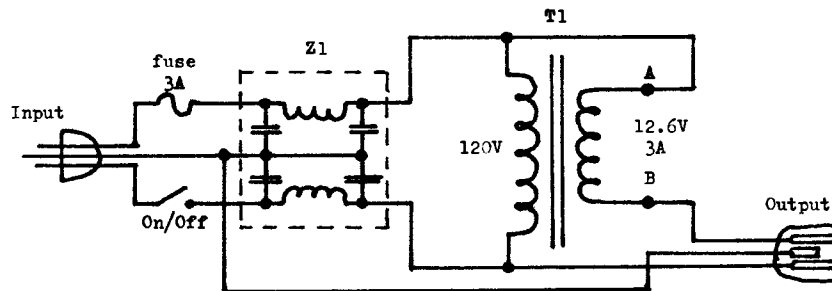
2 3

If the unregulated DC voltages measure more than 10% above the minimum values and the AC measures more than 110 Volts, proceed to step 3.

3. Wire up the circuit shown in figure 1. This device is called a bucking transformer. The voltage at the output socket is lowered from that at the input by the rating of the transformer secondary. In other words, if the input is 120VAC and the secondary is 12.6VAC, then the output will be 120-12.6 or 107.4 Volts. Before connecting the Sol to the output check the voltage. If it measures instead, 132.6 Volts, reverse the connections to the secondary at points A and B. The transformer specified will carry the full load of the Sol up to the point the 3A fuse of the Sol itself blows. Note that a bucking transformer need carry only a portion of the load. A stepdown transformer must be rated for the full load. If you build this circuit into a handy box, you may want to include an interference filter at the same time. If you want to lower the voltage even more, select the appropriate transformer with the desired secondary rating. The current rating of the secondary should be at least 3 Amps. A reduction of 10% input voltage should result in a 20% power reduction and a much cooler Sol.

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Contact M. Graebner
Educational Management, Inc.
2831 Seventh Street
Berkeley, CA 94710
(415) 848-5527



T1 - Radio Shack 273-1511

Z1 - Optional Interference filter "Brute-Force" type
see any edition of Radio Amateur's Handbook

Fig. 1

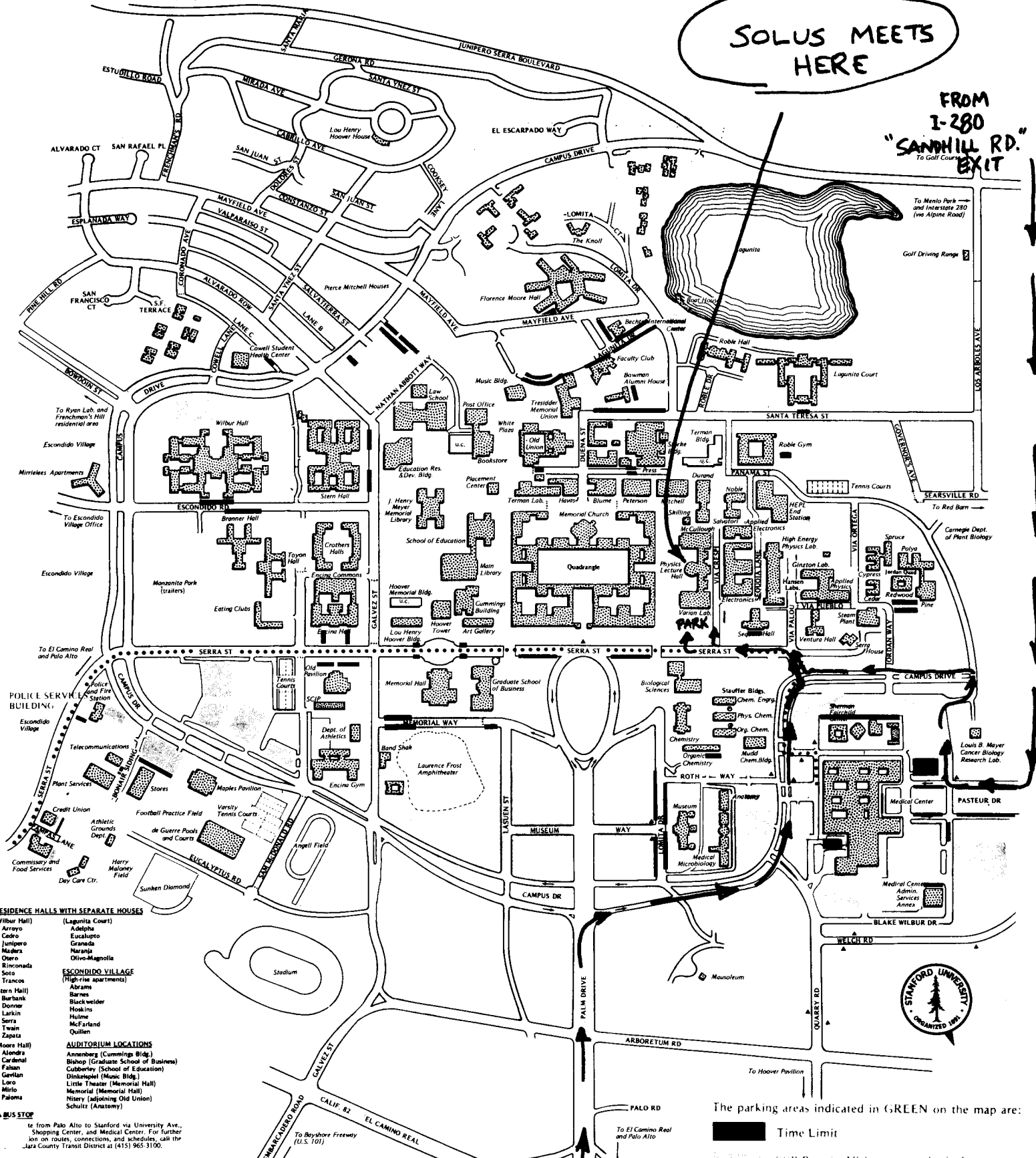
Joe Maguire

STANFORD UNIVERSITY

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 - Dier
 - Biconozza
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 - Trancos
- ESCONDIDO VILLAGE (High-rise apartments)**
- Starn Hall
 - Alber
 - Barne
 - Blackwelder
 - Hoskins
 - Hulme
 - McFarland
 - Quillen
- AUDITORIUM LOCATIONS**
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 - Cardinal
 - Falson
 - Cerlan
 - Laro
 - Mirio
 - Paloma

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- Time Limit
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REVISED 8-76

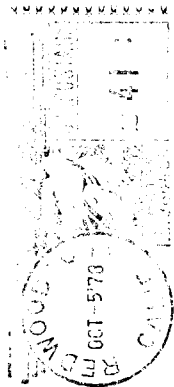
PS67-876 75 M



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SOLUS NEWS
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 REDWOOD CITY, CALIFORNIA 94061

FIRST CLASS



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HELIOS NEWS

A NEWSLETTER FOR OWNERS OF PROCESSOR TECHNOLOGY SOL SYSTEMS

VOL. 1, No. 6 PUBLISHED BIMONTHLY OCTOBER/NOVEMBER 1978

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THIS IS THE
LAST ISSUE
UNDER 1978
SUBSCRIPTIONS.

SEE ORDER FORM
IN BACK PAGES
FOR 1979 RENEWAL

HELIOS LIBRARY READY TO SHIP FIRST DISKETTE PASCAL AVAILABLE

Our first volume (diskette) of the Helios library is ready for distribution by mail. We have collected a number of utility programs and one major system (PASCAL) which are to serve as the seeds to grow a large library of PTDOS-compatible software. A listing of the table of contents of this diskette is printed in this issue. You'll see that the PASCAL is a preliminary version, but nevertheless powerful enough to compile the PASCAL compiler itself. It is an excellent system for learning the language and has nearly all of the standard PASCAL language. It is integrated into PTDOS so it uses the same text file structure as other PTC languages. (This is in contrast with the U.C.S.D. PASCAL system which has its own unique file structure.) It runs about 20 times faster than a fast integer BASIC (Palo Alto TINY BASIC) which itself is faster than full feature BASICs. The diskette also contains improved versions of the original (PTDOS 1.4.0) commands "GET" and "FILES", a statistical program, some new commands, a video football game, etc.

To encourage the growth of the library, we have two ways to get the diskette. First, the preferred way is by sending \$10 (US dollars) and an acceptable file for donation to the library, on your Helios diskette. An acceptable program will be defined below. Second, not to exclude those who don't have a program to contribute, the diskette can be purchased for \$25 without a donated program. (If you donate a program, your diskette will be returned as well as a new diskette with the library volume on it.)

An acceptable program is basically any non-copyrighted work of your own creation. Since the entire contents of magazines are copyrighted, programs copied from magazines are not acceptable, even if extensively modified. (The modifications are your own creation so they are acceptable, but not the copied work.) Ideas aren't copyrightable, so you can write your own program that is functionally equivalent to a copyrighted work without violating the copyright. Copyrighted work can be donated only if the written consent of the author and copyright owner are obtained. If you are donating a program, we ask that you read

and complete the copyright statement on the order form at the end of this issue.

We are in the process of converting the CP/M users library to run under PTDOS, and as these programs become available they will be added to the library in future volumes.

Donated work is not limited to computer programs. If you have a useful data file (such as a dictionary, stock market data, a tutorial text, etc.) you can submit it provided it is otherwise acceptable (non-copyrighted).

Since programs and data require documentation, we also require a file of documentation to accompany each submission. Guidelines for the format and names of these files are explained elsewhere in this issue.

GUIDELINES FOR SUBMISSION OF FILES TO HELIOS LIBRARY

1. FILE NAMES: Since the same program can exist in several forms, we have established the following conventions for file names to distinguish between these alternative forms. Users of the library may want to rename the files for their own convenience, but at least the library will be consistent.

- a. Names should not contain lower case letters.
- b. Each name should end with a suffix that indicates the form of the data contained in the file. For example, by convention already established in PTC documents, assembly language source programs have the suffix ":S". Select the suffix from the following list. If none are appropriate, create a new suffix and we'll add it to the list.

- :S Source code, regardless of the language. (The PTDOS file type will indicate the language.)
- :O Object code, such as compiled form of BASIC or PASCAL. (The actual object language is indicated by the file type field. See below about image files.)
- :T Text, not in a programming language. Use this type for data files that are in ASCII, such as a dictionary, a table, a document, etc..

(Continued on page 2)

GUIDELINES FOR SUBMISSION OF FILES TO HELIOS LIBRARY

(Continued from page 1)

- :D Documentation text file which explains how to use the other files having the same prefix name.
- :C Contents abstract for addition to the Table of contents file on the diskette. This is a text file similar to the ":D" type, but being a very brief description of the main program or file so that a user will know if he wants to look into the ":D" file. This file will be published in the catalog of library programs.
- none No suffix is necessary if file is an image file, such as a command name, or if it is a device file. You can use the ":O" suffix if you desire.

c. For example, a BASIC program ("PROG") in text form will need the following files: PROG:S, PROG:D, PROG:C. A device driver ("DEVICE") submitted as both source and assembled files of type "D" will need files: DEVICE:S, DEVICE (type D), DEVICE:D, DEVICE:C

d. The colon in the above examples can be replaced by another punctuation character if you prefer.

2. FILE TYPES: The file types will indicate the language of the program. Whenever a PTC file type convention is relevant, it should be used. (See section 3 of the PTDOS manual.)

The following types have been established so far. As with file names, if none of these are appropriate, create your own and we'll add it to the list.

HEX VALUE	SYMBOL	DESCRIPTION
80	00	System files (reserve for PTC)
81	01	Numeric data in binary form
82	02	Numeric data in BCD form
83	03	Stored FOCAL program
84	04	Semi-compiled BASIC/5 program
85	05	Semi-compiled EDBASIC program
86	06	Source (text) EDBASIC program
87	07	Serial access files
88	08	Random access data file
C1	A	Archive (SAVE) file
AE	.	Default
A4	\$	DO file with command lines
D4	T	Text file (also BASIC/5 text form)
C0	P	PASCAL source code (text form)
F0	p	PASCAL p-code form (semi-compiled)
00	I00	Image files associated with system
43	IC	Command files
47	IG	Games (image file)
53	IS	Major subsystem (compiler, etc.)
54	I\$	Command for use in DO files
2A	I.	Default image file

CONTENTS OF FIRST HELIOS LIBRARY DISKETTE

Documentation of Files on this Diskette

- SOLOS:S A copy file for standard and my extended version of SOLOS. The original source was obtained from the CP/M users group. Proc. Tech. may have rights to this program. My mods are public. Functions with or without extension PROM board in memory. Can be used for Standard SOLOS by conditional assembly. Uses files named SOLOSn:S. (Donated by Ron Parsons.)
- SOLOS:D Further documentation of the files SOLOS:S, etc. above.
- COPYF:S Copies the files listed after command (separated by commas) from disk 0 to disk 1 preserving attributes. Requests permission to rewrite an existing file. (Donated by Ron Parsons.)
- RELOC:S Relocation program from July 1977 Byte.
- NFILES?S Prints the number of files on the unit "/u" (Donated by Ron Parsons.)
- FSDISP:S Displays the free space map on the unit "/u" (Donated by Ron Parsons.)
- REMNUM:S Removes line numbers (first five cols.) from named files. (Ron Parsons)
- INTSEL:S Interrupt driven background Selectric driver. To be (?) described in PTCs ACCESS. (Ron Parsons.)
- SFILES:S Displays a compact list of all files on the unit given as parameter "/u". If no unit given, uses default. Name stands for "Short Files". (Ron Parsons.)
- SFILES Command image for the Short Files command above. Recognizes the "/u" parameter.
- PRROM:S Standalone Cromemco Bytesaver prom-programmer (SOLOS) (Ron Parsons.)
- REORG:S A PTDOS disk reorganize. Copies all files from unit zero to unit one. Does not rewrite existing files. (Ron Parsons)
- COMPAR:S Compares the two PTDOS files named listing differences Assembly source file. (Ron Parsons)
- SOL:S Assembly source code for PTDOS command "SOLOS" which turns control over to SOLOS. Assumes SOLOS is at C000 as in the SOL. Once in SOLOS, the command "PT" will get back to PTDOS, assuming it is still unharmed in memory. (Stan Sokolow)
- DSTAT EDBASIC program for descriptive statistics (mean, etc) (Stan Sokolow)

(Continued on page 3)

CONTENTS OF FIRST HELIOS LIBRARY DISKETTE

(Continued from page 2)

- PRINTER** Driver for selectric terminal (IBM 2741 compatible) on SOL's serial port. Uses SOL built-in RAM and PTDOS driver area. BE SURE TO CHANGE TYPE TO "D" BEFORE USING; Output device only. (Input not implemented.) System reset will wipe out initialization part of driver, so be sure to load new image of it. (Donated by Stan Sokolow.)
- DMOVE:S** Assembly source code for a delimited-move subroutine. It moves bytes from a source address to a destination address until count is reached or a delimiter byte is encountered. Unlike PTDOS's PSCAN routine, DMOVE lets the user define his own set of delimiter bytes. Additional explanation is in the code's remarks. (Donated by Stan Sokolow.)
- LD** List directory in alphabetical order, file names only. DOESN'T READ PARAMETERS; ALWAYS USES DEFAULT UNIT. (Donated by Chuck Ellis.)
- S** Jumps to SOLOS but gives description of all SOLOS commands first. Adds custom commands to get back to PTDOS. (Donated by Chuck Ellis.)
- NEWGET** This is a corrected version of the GET command that was originally released in PTDOS 1.4.0. It automatically will GET device files without RETYPE'ing them by hand. You can copy NEWGET to GET on your working diskettes. (Donated by Processor Technology Corporation.)
- NEWFILES** A corrected version of the FILES command which recognizes Upper and Lower case letters as equivalent in file names. The FILES released in PTDOS 1.4.0 treated the two cases differently when searching for files that match bracketed substring specifications. Eg., FILES s and FILES S found different files in the original version, but this version is corrected. (Donated by Processor Technology Corp.)
- FOUR** Generates random "four-letter words". Mode Select terminates and returns to PTDOS. Words are displayed in large block letters on the video screen. Rated PG --Parental Guidance recommended.
- HELP** Provides a brief explanation of PTDOS commands. If a command file name is given as the argument after the name HELP, an explanation of the named command will appear. Otherwise, a summary of the HELP command is given. (Donated by Processor Technology Corp.)
- HELP:T** This is the reference data for the HELP command. HELP expects this file to be on the default unit.
- MIND:S** Assembly language source for the MIND Robot Control Language by Lichen Wang, see DR. DOBBS JOURNAL, Sept 77, revised by Ken Anderson, DR. DOBBS, May 78. (Donated by Earl Herr.) IN ALS-8 FORMAT A .
- PASCAL** The Stanford Micro Pascal System, dated 9-13-78, from Stanford Linear Accelerator Center, Stanford University. (Donated by Sassan Hazeghi, Computer Group, S.L.A.C.) Essentially the entire P-code implementation of the PASCAL computer language, as implemented for the IBM 360/370 computers. Except for generalized FILE declarations and passing FUNCTIONS/PROCEDURES as parameters, it adheres to the standard PASCAL as defined by Jensen and Wirth in the 1974 PASCAL User Manual and Report. It is NOT the U.C.S.D. system. The Stanford version runs under PTDOS, and thus it can pass data to other programs not written in PASCAL using normal PTDOS file structures. This preliminary release does not have the REAL arithmetic implemented in the interpreter, so only 16-bit integer arithmetic can be used, even though REAL will compile. RAM REQUIRED: 30K TO 36K PLUS PTDOS TO COMPILE PROGRAMS OF MODERATE SIZE. See file PAS.DOC for a more complete description. The source PASCAL for the compiler, post-processor, and the assembly source for the interpreter are NOT on this diskette. TO RUN THIS SYSTEM YOU SHOULD HAVE 48K CONTIGUOUS RAM FROM THE BOTTOM UP, TO HOLD PTDOS AND THE PASCAL SYSTEM. MORE MEMORY CAN BE UTILIZED, BUT IT TAKES MODIFICATION TO THE INTERPRETER. A VERY LARGE PROGRAM (THE PASCAL COMPILER ITSELF) WAS COMPILED IN THAT WAY ON A SOL. ***SET BU=8800 and execute the INITPATB command before running PASCAL.****
- PAS.DOC** Documentation for the Stanford Micro Pascal System.
- THE FOLLOWING FILES ARE RELATED TO PASCAL AND ARE DESCRIBED IN "PAS.DOC": PAS.S, PASM.S, PINTRP.S, PASCAL, PASM, PINT, COMPILE, RUN, TEMP.T, TEMP.P, QUEENS:S, SORT:S, XREF:S, SOMA:S, POBJ, F:S, PAS.CMPL, PAS.DEFS, INITPATB.
- FOOTBALL** An EDBASIC program for 2 player video football. Self-documenting. (Donated by Gerry Fricke; adapted to disk BASIC by Stan Sokolow.)
- NOTICES** Important legal notices regarding this diskette.
- WARRANTY** The limited warranty on this diskette.
- FEEDBACK** Explanation of how to report problems you encounter with this diskette's programs.

REVIEW OF THREE SMALL TEXT EDITORS BY J. TOM

The EDIT program by Processor Technology is a cassette supporting version of the EDIT3 program distributed in the Helios software package. The program resides in the lower 6.5 Kbytes of memory, and this includes 2 Kbytes reserved for the input and output file buffers. The program is self-supporting with the exception of calls made to SINP, SOUT, RDBLK, and WRBLK.

In the SOLOS/CUTER monitor, EDIT does assume the presence of a VDM, as all input and output is echoed to pseudo-port 0. The user must specify the pseudo-port that he wishes the hard copy data sent to, by setting "O=1, or 2, or 3" prior to executing EDIT.

The EDIT program sizes memory upon initial execution, and unless the user indicates otherwise, the program will use all the available memory as text buffer.

Since EDIT is character oriented rather than line oriented, the 'RETURN' key can not be used to terminate a command line. Instead, the 'ESCAPE' key is used, with the key being echoed as "\$". This takes some settings used to, and I still on occasion, type a 4 instead of 'ESCAPE'.

The user may have an input cassette file, and/or an output cassette file open. These files may have the same or different names (if you wished to join two separate files), and may be any length from 256(100H), to 1024(400H) bytes. This is possible because the "block read/write" routines instead of the "byte read/write" routines. In addition to defining the name, and block length of a file, a file may also be saved in "pages" which may correspond to a page worth of material, or a logical break point in subject matter. There are several commands which control the manner in which a file is read or written, and commands that will search through a file looking for a specified string, or search for, and replace a string.

EDIT operates using a Character Pointer and it is up to the user to see that the Character Pointer (CP) is properly positioned at all times. Since the results of your commands can only be observed after they have been carried out, it is always a good idea to check the CP position before entering any text. The user of this program is encouraged to read and reread about the effect that each of the commands has upon the CP.

The string search and substitution capability was a key factor in my decision to purchase this program. As well as finding a fully defined string, the program will also find a partially defined string, so that "M#s\$" will find any occurrence of Miss or Mrs., for instance, using a single command. The command would also find Moss, but not moss. One must be careful when defining the string to be changed. For instance if commanded to change every occurrence of "and" to "A", then "sand" becomes "sA". Enough characters must be given to uniquely identify the string that is to be found or changed.

Text is inserted at the position of the CP, and the insertion may be of any length. Deletions also occur at the position of the CP. Deletions may be made at the character, string or line level.

An interesting feature of the program is the ability to generate MACRO commands. Any of the individual commands may be joined together and defined as a macro command. Whenever the macro is called, those individual commands will be executed. This saves entering a particular command string over and over, for instance to scroll through a text buffer, or to define the contents of one page when using cut paper in a printer. In addition to the macro commands, any normal command string that

was fully carried out (no errors), may be repeated by entering CTRL-R as the next command, which in effect gives you a second macro definition.

Included with EDIT are two other programs, PACK and UNPAC. PACK takes a multi-block file, and will generate a single block file, either in ALSB format or as an image file. UNPAC will take a single block file and generate a multi-block file compatible with EDIT, or in the case of a BASIC image file, compatible with Ext. Cassette Basic. This allows you to edit a Basic program using either EDIT or Basic.

My needs for an editor/text processor for personal use are covered adequately by the EDIT program, and at \$20, it is a bargain. I would have liked to have seen a block move routine included, but since the program has the capability of calling a subroutine outside the program, it should be possible to write a routine using Control Characters to act as delimiters and pointers for the move. It would be nice if the program would automatically print any line that is modified, and if it were possible to declare a new file, deleting any old text, but these minor points can be lived with.

Processor Technology also offers a line oriented, video text editor. This, of course, is the TXT-2 extension to ALSB. This program uses the VDM as a window to observe the text buffer 16 lines at a time. With this program, line length is limited to 64 characters, as the cursor wraps around on itself. If lines of greater than 64 characters are created outside the editor, when the editor is called, those lines will set out to 64 characters.

Editing with this program is quite simple as you can observe the effects of your editing on the video monitor. The editor uses Control characters as commands to scroll line by line or page by page, to move the cursor left and right, and to enter "insert" mode, or to delete. In addition, the cursor control keys on the Sol-20 have the same effect as the control character, on the cursor.

While TXT-2 has a "FIND" function, it does not have a "REPLACE" function. Once a string is found, the line that the string is found on becomes the current line for editing.

If you are interested in a relatively primitive editor, an assembler, and a simulator for debugging programs, ALSB on cassette at about \$45 is not a bad deal. TXT-2 has no processing capabilities to define printing format.

I called TECHNICAL SYSTEMS CONSULTANTS Inc., who seem to have the only other reasonably priced editing/processing software, and they were kind enough to send me some data on their programs.

TSC's editor is line oriented, and supports most of the functions of PT's editor, and a few things that PT does not have including block move, and restricted zone string search. Commands are included to read or save a file on tape. Since the source code for the program is provided, it should be easy to patch this program to SOLOS/CUTER.

Note: The editor program has no print formatting capabilities. Its sole purpose is to generate a text file.

The price is \$28.50 for the manual and source code, add \$9.00 to set the program on paper tape in INTEL HEX FORMAT.

For print formatting, TSC offers a TEXT PROCESSING program which was reviewed in CREATIVE COMPUTING, July/August '78 issue. I have had the pleasure of using the Xerox Electronic Typing System, and the TSC appears to support virtually all the functions of the ETS and even has a few tricks of its own. As one might imagine, the Text Processing program requires a line oriented text file input, and, it offers no text editing capabilities.

REVIEW OF THREE SMALL TEXT EDITORS

(Continued from page 4)

Price of the program is \$32.00 for the manual and source code. Add \$9.00 for a paper tape of the object code. From what I can see, the combination of the text editor and text processor programs will out perform the ELECTRIC PENCIL, reviewed in the June issue of SOLUS NEWS at a lower cost. The only hang-up may be finding a paper tape reader to use to load the program.

A release sheet that they sent along indicated that they had CP/M compatible Editor and Processing programs at \$40.00 and \$50.00 respectively (includes program on 8" disk).

There is one last source of a cheap text editor, but requires that you have the patience to type in the program. The source of the program is DR. DORRS JOURNAL, vol.1 no.6. The program is a line oriented text editor written by one F.J.Greeb, and seems to be quite complete in its editing functions. The object code in the side by side listing is in octal, so unless you have an assembler, you are in for one heck of a time entering the program. You would also have to write the interfaces to SOLOS/CUTER if you wished to use it's routines.

ANNOUNCING PROTEUS: A SUPER-SOLUS
BY STAN SOKOLOW

As I've mentioned before in Solus News, there is a dirth of volunteers to serve on a committee to operate Solus. In the last issue, I put out a call for nominations of new officers. The expected response was received: an inadequate one. I can understand everyone's need for the services of Solus and their reluctance to give up valuable time for it. As Processor Technology Corporation makes further sales to the small business marketplace, rather than the hobby market that got it started, the character of Sol owners will change even further in the direction of the pure "End User" and away from the hobbyist.

In response to these perceived trends, I am making a change in the nature of my operation. Solus, as a voluntary association of Sol owners, will continue to exist primarily as the conglomeration of local hobbyist groups. A new organization covering the entire Processor Technology Corporation product line will take over the publication of Solus News, and the providing of other needed services to owners of PTC equipment, including Sol, Helios, Subsystem, and new products. The poor performance of HELIUM has prompted me to take on the Helios. To indicate this new scope, the name of the organization will be PROTEUS, representing a Users Service for owners of Processor Technology equipment. It, as Solus has done, will maintain an independent but cooperative posture toward PTC as well as toward other manufacturers of compatible equipment.

Some of the services that are planned for PROTEUS include a library of Helios-compatible software, publication of Solus News (name will change perhaps), a library of cassette software, a media conversion project to get software across media bounds (e.g., CP/M software onto Helios), software directory, and sale of proprietary programs. The whole operation will be more reliable and business-like. We'll have a paid staff (although a small one) so that everyone working on the projects will have motivation to get it done well and will be rewarded for their effort. If you have suggestions for other services, please let me know.

It is my intention that PROTEUS will fill the gap between what PTC can do and what the users need. The next year will tell whether we can achieve this, but we're sure going to try. As I've announced elsewhere in this issue, we're on the way toward some of these goals already.

BLOCK MOVE FOR PTC CASSETTE "EDIT"
BY J. TOM

As I stated in the review I wrote, it shouldn't be too hard to write a routine to support the block move, and I was right.

Enclosed is the result of my efforts, a source and object code listings of MOVER. This routine is called using the "G" command in EDIT. Prior to entry, the area to be moved must be defined. This is done by inserting the "first"(CTRL-B or 02H), and "last"(CTRL-C or 03H) characters at the boundaries of the area to be moved. The results of this may be viewed on the VDM as the "first" and "last" characters show up as 1 and 1, respectively. Upon entry, the CP must be pointing to the location for the text to be inserted. The routine checks for the first and last characters, and to see that the insert location is not located within the area to be moved. If any of the checks fail the program returns via the normal error loop. On exit, the CP is set to point to the end of text.

The program should work with the Helios version of EDT3 providing all the EQU's are the same.
(ED, NOTE: PROBABLY AREN'T BECAUSE HELIOS SOFTWARE ORG'S 100H,)

```

C900          0001 *****
C900          0002 * - MOVER - A BLOCK MOVING ROUTINE*
C900          0003 * FOR USE WITH THE EDIT PROGRAM. *
C900          0004 * CALLED USING THE "G<ADDRESS>*" *
C900          0005 * COMMAND. WRITTEN BY J.TOM *
C900          0006 * CSTSC/CODES3 MAKE ISLAND, CA. *
C900          0007 *****C SEPT. 13, 1978 J*****
C900          0008          ORG      00900H
C900          0009 *
C900          0010 *** EQUATE TABLE ***
C900          0011 *
C900          0012 LENGTH EQU      1899H
C900          0013 CFLAG EQU      189FH
C900          0014 SAVSTR EQU      18A3H
C900          0015 RESET EQU      472H
C900          0016 CPEND EQU      821H
C900          0017 SEARCH EQU     93CH
C900          0018 VALCHK EQU     923H
C900          0019 TWOCMP EQU     928H
C900          0020 OPENUP EQU     0A3CH
C900          0021 DELETE EQU     0A7EH
C900          0022 SCREEN EQU     0D3BH
C900          0023 ERROR EQU      2D6H
C900          0024 FIRST EQU      2          CTRL-B
C900          0025 LAST EQU       3          CTRL-C
C900          0026 ESCAPE EQU     1BH
C900          0027 *
C900          0028 *
C900          0029 MOVER EQU      $
C900          0030 *SAVE INSERT ADDR
C900          0031          LHD   CFLAG
C900          0032          SHLD INAD
C900          0033 *MOVE CP TO TOP OF TEXT
C900          0034          CALL RESET
C900          0035 *LOOK FOR FIRST AND LAST CHARACTERS
C900          0036 *IF FOUND, LOCATION IS IN HL
C900          0037 *IF NOT FOUND, CARRY IS SET
C900          0038          LXI   D,CMDSTR
C900          0039          CALL SEARCH
C900          0040          JC   FERROK
C900          0041          SHLD FADDR
C900          0042          INX   D
C900          0043          CALL  SEARCH
    
```

BLOCK MOVE FOR PTC CASSETTE "EDIT"

(Continued from page 5)

```

C919 DA 81 C9      0044      JC      LERROR
C91C      0045 *NOW FIND LENGTH OF TEXT TO MOVE
C91C 2B      0046      DCX      H
C91D E5      0047      PUSH     H
C91E E5      0048      PUSH     H
C91F 2A A0 C9    0049      LHL D  FADDR
C922      0050 *TWO CMP RETURNS 2'S COMP.
C922      0051 *OF HL PAIR IN DE PAIR.
C922 CD 28 09    0052      CALL    TWO CMP
C925 E1      0053      POP      H
C926 19      0054      DAD      D
C927 22 99 18    0055      SHLD   LENGTH
C92A      0056 *NOW TO MAKE SURE THE INSERT ADDR.
C92A      0057 *IS NOT BETWEEN THE MOVE ADDRS.
C92A D1      0058      POP      D
C92B 2A 9E C9    0059      LHL D  INADD
C92E EB      0060      XCHG
C92F CD 23 09    0061      CALL    VALCHK LAST<INSERT?
C932 2A A0 C9    0062      LHL D  FADDR
C935 EB      0063      XCHG
C936 DA 48 C9    0064      JC      OKAY CARRY=YES
C939 CD 23 09    0065      CALL    VALCHK INSERT<FIRST?
C93C D2 87 C9    0066      JNC    IERROR CARRY=YES
C93F      0067 *IF INSERT AREA IS AHEAD OF MOVE ADDRS.
C93F      0068 *THEN WHEN THE INSERT AREA IS CLEARED,
C93F      0069 *THE FIRST MOVE LOCATION WILL BE MOVED
C93F      0070 *DOWN BY THE LENGTH OF THE INSERTION.
C93F E5      0071      PUSH     H
C940 2A 99 18    0072      LHL D  LENGTH
C943 19      0073      DAD      D
C944 22 A0 C9    0074      SHLD   FADDR
C947 E1      0075      POP      H
C948      0076 *
C948      0077 *UPON ENTRY, HL PAIR EQUALS INSERT ADDR.
C948      0078 *TEXT BELOW THE INSERT POINT IS MOVED
C948      0079 *DOWN TO MAKE ROOM FOR THE INSERTION,
C948      0080 *THEN THE INSERTION IS MADE.
C948      0081 *
C948 22 9F 18    0082 OKAY  SHLD   CPLOC
C94B CD 3C 0A    0083      CALL    OPENUP
C94E 2A 9E C9    0084      LHL D  INADD
C951 EB      0085      XCHG
C952 2A A0 C9    0086      LHL D  FADDR
C955 7E      0087 LOOP  MOV     A,M
C956 FE 03      0088      CPI    LAST
C958 CA 61 C9    0089      JZ     ERASE
C95B 12      0090      STAX  D
C95C 23      0091      INX   H
C95D 13      0092      INX   D
C95E C3 55 C9    0093      JMP    LOOP
C961      0094 *
C961      0095 *ONCE THE MOVE IS MADE, THE OLD TEXT
C961      0096 *IS WRITTEN OVER BY MOVING THE TEXT
C961      0097 *BELOW THE MOVE AREA INTO THE MOVE
C961      0098 *AREA. LENGTH IS INCREASED BY 2 SO
C961      0099 *THAT "FIRST" AND "LAST" WILL BE
C961      0100 *ELIMINATED ALSO. FADDR IS DECREASED
C961      0101 *BY ONE TO POINT TO "FIRST". THE CP
C961      0102 *IS SET TO THE END OF TEXT BEFORE
C961      0103 *RETURNING TO EDIT. CHANGE CPEND TO
C961      0104 *RESET TO SET CP TO TOP OF TEXT.
C961      0105 *
C961 2A 99 18    0106 ERASE LHL D  LENGTH

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C964 23      0107      INX   H
C965 23      0108      INX   H
C966 22 99 18  0109      SHLD  LENGTH
C969 2A A0 C9  0110      LHL D  FADDR
C96C 2B      0111      DCX   H
C96D 22 9F 18  0112      SHLD  CPLOC
C970 CD 7E 0A  0113      CALL  DELETE
C973 CD 21 08  0114      CALL  CPEND
C976 C9      0115      RET
C977      0116 *
C977      0117 *FAKE COMMAND STRING FOR SEARCH ROUTINE
C977      0118 *
C977 02      0119 CMDSTR DB  FIRST
C978 1B      0120      DB  ESCAPE
C979 03      0121      DB  LAST
C97A 1B      0122      DB  ESCAPE
C97B      0123 *
C97B      0124 *ERROR HANDLING ROUTINES
C97B      0125 *
C97B 21 A2 C9  0126 FERROR LXI  H,NOFRST
C97E C3 8A C9  0127      JMP  IERROR+3
C981 21 AB C9  0128 LERROR LXI  H,NOLAST
C984 C3 8A C9  0129      JMP  IERROR+3
C987 21 B3 C9  0130 IERROR LXI  H,INERR
C98A CD 3B 0D  0131      CALL  SCREEN
C98D CD 21 08  0132      CALL  CPEND
C990      0133 *MOVE COMMAND STRING POINTER BACK
C990      0134 *TO PRINT ENTIRE 'GC900$' COMMAND
C990 2A A3 18  0135      LHL D  SAVSTR
C993 EB      0136      XCHG
C994 21 FC FF  0137      LXI  H,-4
C997 19      0138      DAD   D
C998 22 A3 18  0139      SHLD SAVSTR
C99B C3 D6 02  0140      JMP  ERROR
C99E      0141 *
C99E      0142 *STORAGE AND MESSAGES
C99E      0143 *
C99E 00 00      0144 INADD  DW  0
C9A0 00 00      0145 FADDR  DW  0
C9A2 4E 6F 20 46 69 72 73 74  0146 NOFRST ASC  /No First/
C9AA 0D      0147      DB  0DH
C9AB 4E 6F 20 4C 61 73 74  0148 NOLAST ASC  /No Last/
C9B2 0D      0149      DB  0DH
C9B3 49 6E 73 65 72 74 20 6C 6F 63 61 74 69 6F 6E 20 65 72 72 6F  0150 INERR  ASC  /Insert location error/
C9C8 0D      0151      DB  0DH

```

MEMORY SEARCH UTILITIES FOR SOL

BY FR, THOMAS MC GAHEE

If you have a Sol Computer by Processor Technology, or a computer that uses the Solos ROM as a monitor, then you should find these memory search utilities useful. By making extensive use of routines already contained in Solos, it was possible to squeeze into 273 bytes a program that allows the user to clear memory, search for a given byte, search for two-byte patterns, and display 960 bytes of memory on the VDM display.

The program resides in the Sol on-board RAM area, from C900 to CA10 (although it may reside anywhere). The reason for choosing this area of RAM is that every Sol Computer has RAM in this area, and it is often unused. In addition, I have written the memory clear routine to clear memory only up to the Solos ROM which starts at C000...in this way the memory utilities are never cleared.

The Sol Computer has as its main output device a Video Display Monitor (VDM) that is a memory-mapped device. This, coupled with the fact that it will display a unique character for every combination from 00 to FF, makes it possible to obtain a visual copy of sections of memory.

Unlike some memory search programs that only identify where in memory a match has been found, these utilities show you the matched character(s) IN CONTEXT. This allows the user to quickly determine whether or not he has really found what he is looking for, or whether he must continue his search.

Another nice feature about these utilities is that they are accessed by means of Solos CUSTOM COMMANDS. The first part of the program actually loads the custom commands into the custom command table. Should the custom commands be erased (as they are any time the Sol is reset), they may be reloaded simply by typing "EX C900". This assumes of course, that you already have the program in memory.

USING THE UTILITIES

Normally the utilities will be loaded via tape or disk. Once the program is in, type "EX C900". This will load the custom command table, allowing the utilities to be accessed by their custom command names.

CL "CL" is the custom command to clear memory. Memory is cleared from 0000 to C000. "Clearing" consists of filling the memory with the code for a 'space'. The reason for using a space rather than 00 is that VISUALLY a space shows up as a blank area. The clear character is located at CA06, should you wish to change it. To clear memory type "CL" followed by a carriage return. When the Solos prompt character reappears, memory is cleared.

FN "FN" is the custom command to "Find a Number." This is a search for a single byte. Type "FN XX", followed by a carriage return, where XX is a hexadecimal number in the range 00 to FF. When a match is found, the address of the match will appear at the top of the VDM screen. Nine lines of 64 characters will be displayed along the bottom half of the screen. The found character will be the first character on the middle (fifth) line. To aid in quickly spotting the character, it is made to blink under software control. To continue the search, hit the space bar or any key except "Mode Select". The addresses of all matches will be listed

one after another along the top of the screen. When room runs out, the addresses will be written over the first addresses listed, always keeping the bottom half of the display free for displaying the matched character "in context". The program will terminate automatically after one complete pass through 64K of memory. The user may also terminate the search at any time by hitting the "Mode Select" key. Terminating causes the Solos prompt character to be displayed.

FC "FC" is the custom command to search for two contiguous characters. Type "FC AB" followed by a carriage return, where "AB" is the character combination to be searched for. The format for displaying matches is the same as that described for the "FN" command, and termination occurs in the same way. The search characters may be a combination of letters, numerals, and control characters, although certain control characters are disallowed because they have immediate action. Among these are control A, J, M, S, Q, Z, which perform cursor control or carriage return or line feed operations. In addition, leading spaces cannot be searched for, although trailing spaces are OK. (This is due to the way a command line is scanned by Solos). All search characters are entered as regular non-inverted characters, but searches are made with the most-significant-bit stripped, so matches will occur on both inverted and non-inverted video characters. The address given at the top of the screen is the address of the first character in the search pair.

SC "SC" is the custom command to display a block of memory on the screen. Type "SC XXXX" followed by a carriage return, where XXXX is the address of the first byte to be displayed. (The address may be entered in a shorter form if desired. 23 is the same as 0023). The screen will display 15 lines with 64 characters per line. The TOP line is reserved for the command line. To continue the search to some other area of memory, simply type in the new address. The program will display the requested area as soon as a carriage return is received. To terminate the screen search, hit the "Mode Select" key. During a screen search, the current address of the first displayed memory byte is maintained on the top line of the VDM screen.

You can test memory by clearing it and then loading it with a known pattern. Using "SC" it is easy to spot any change in the pattern. More importantly, at a glance you can usually detect if there is any repetitive pattern to the errors. I have found the utilities especially useful for modifying software that includes text. It is an easy matter to find the text storage areas and examine the manner in which it is stored. We have used it to find and alter the reserved-word areas of BASIC5 and Extended BASIC, and we also used it to change the messages contained in TRK80. With the ALS-8 assembler, we have found occasion to use it to recover files that had an error in them, and which could not otherwise be saved.

ABOUT THE AUTHOR

Fr. Thomas McGahee is a Catholic priest in the Salesians of St. John Bosco. He teaches electronics and Computer Technology at DON BOSCO TECHNICAL HIGH SCHOOL in Paterson, New Jersey. He has been involved in teaching in the computer field since 1971, and has been active in the field of hobby computers since 1972. He has built several computers including ones based on the 8008, 6800, and 8080, and has been active in the design of various interfaces and peripherals for hobby computers. He has

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MEMORY SEARCH UTILITIES FOR SOL

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had articles published in BYTE, ELECTRONICS, POPULAR ELECTRONICS, PCC, and in numerous newsletters put out for the hobby computer market.

Fr. Tom is active both in hardware design and in software programming.

Bro. Al Roman, co-author of the software included in this article, is also a teacher at Don Bosco Tech. He teaches Machine Shop as well as a course in Machine Language and Assembly Language Programming for the 8080 computer. Bro. Al has used computers for Numerical Control applications in the machine shop, and is a dyed-in-the-wool software freak.

7000	0001 * MEMORY SEARCH UTILITIES	C922	0049 * LOCATE TWO CONSECUTIVE CHARACTERS
7000	0002 * FOR PROCESSOR TECHNOLOGY	C922	0050 *
7000	0003 * SOL COMPUTERS.	C922	0051 * ON SCREEN: ADDRESS OF FIRST CHARACTER
7000	0004	C922	0052 * (BLINKING) FIRST CHARACTER AT MIDDLE
7000	0005 * WRITTEN BY BRO. AL ROMAN	C922	0053 * LEFT OF VDM SCREEN.
7000	0006 * AND FR. THOMAS MCGAHEE	C922 CD 1B C3	0054 *
7000	0007 * DON BOSCO TECH.	C925 EB	0055 FCHR CALL SBLK GET SEARCH CHARS.
7000	0008 * PATERSON, NEW JERSEY 07502	C926 56	0056 XCHG . INTO H-L
7000	0009	C927 23	0057 MOV D,M SAVE FOR LATER.
7000	0010 * THESE UTILITIES MAKE	C928 5E	0058 INX H
7000	0011 * EXTENSIVE USE OF ROUTINES	C929	0059 MOV E,M
7000	0012 * CONTAINED IN SOLOS.	0060 *	
7000	0013	C929 CD D5 C0	0061 CALL PERSE CLEAR SCREEN
7000	0014 * PROVIDES UTILITIES TO	C92C 42	0062 MOV B,D
7000	0015 * SEARCH MEMORY FOR A BYTE.	C92D CD 19 C0	0063 CALL SOUT PRINT CHARACTERS..
7000	0016 * SEARCH FOR TWO ADJACENT	C930 43	0064 MOV B,E
7000	0017 * ASCII CHARACTERS, DISPLAY	C931 CD 19 C0	0065 CALL SOUT BOTH OF THEM.
7000	0018 * BLOCKS OF MEMORY, AND	C934 CD 06 C4	0066 CALL BOUT PRINT A SPACE.
7000	0019 * "CLEAR" MEMORY UP TO SOLOS.	C937 21 FF FF	0067 LXI H,-1 START AT 0
7000	0020 * ALL OUTPUT IS VIA SOL VDM.	C93A	0068 *
7000	0021	C93A E5	0069 NEXTC PUSH H PREPARE RETURN ADDRESS
7000	0022	C93B 21 3A C9	0070 LXI H,NEXTC POINT TO SEARCH.
7000	0023 ORG 0C900H	C93E E3	0071 XTHL . SNAP USING STACK.
C900	0024 * PROGRAM RESIDES IN SOL SYSTEM RAM.	C93F CD 94 C9	0072 NXTL CALL SINX INCR. HL & CHECK MEMORY.
C900	0025	C942 7E	0073 MOV A,M
C900	0026 * RESET CUSTOM COMMANDS	C943 E6 7F	0074 ANI 7FH CHECK INVERTED VIDEO TOO
C900	0027 *	C945 BA	0075 CMP D
C900 21 3C C8	0028 RESET LXI H,0C83CH POINT TO CUST.TBL.	C946 C2 3F C9	0076 JNZ NXTL
C903 11 11 C9	0029 LXI D,DATA POINT TO CUST.COMMANDS.	C949 CD 94 C9	0077 CALL SINX
C906	0030 *	C94C 7E	0078 MOV A,M
C906 1A	0031 MOR LDAX D MOVE COMMANDS	C94D E6 7F	0079 ANI 7FH
C907 77	0032 MOV M,A INTO TABLE.	C94F 8B	0080 CMP E
C908 23	0033 INX H UPDATE POINTERS	C950 C2 42 C9	0081 JNZ NXTL+3
C909 13	0034 INX D	C953 D5	0082 PUSH D SAVE DATA
C90A B7	0035 ORA A * CUST. NEVER 00	C954 2B	0083 DCX H
C90B C2 06 C9	0036 JNZ MOR	C955	0084 *
C90E C3 C9 C1	0037 JMP COMND GO TO SOLOS.	C955 E5	0085 HERE PUSH H NEXT OCCURRENCE
C911	0038 *	C956 E5	0086 PUSH H ADDR & START OF SCREEN
C911 46 43	0039 DATA ASC 'FC' CUSTOM COMMANDS.	C957 CD 06 C4	0087 CALL BOUT PRINT A SPACE.
C913 22 C9	0040 DW FCHR	C95A CD E8 C3	0088 CALL ADOUT PRINT ADDRESS.
C915 46 4E	0041 ASC 'FN'	C95D E1	0089 POP H
C917 A9 C9	0042 DW FNUM	C95E 7C	0090 MOV A,H
C919 53 43	0043 ASC 'SC'	C95F D6 01	0091 SUI 1
C91B C8 C9	0044 DW SCRN	C961 57	0092 MOV D,A
C91D 43 4C	0045 ASC 'CL'	C962 5D	0093 MOV E,L
C91F 02 CA	0046 DW CLEAR	C963 26 CE	0094 MVI H,0CEH FROM 9TH LINE DOWN
C921 00	0047 NOP . END OF TRANSFER	C965 2E 00	0095 MVI L,0
C922	0048 *	C967 CD 9E C9	0096 CALL DMP ON SCREEN
		C96A	0097 *
		C96A 21 00 CF	0098 LXI H,0CF00H BLINKING
		C96D 7E	0099 LOOP MOV A,M BLINK UNTIL
		C96E EE 80	0100 XRI 80H A KEY IS HIT.
		C970 77	0101 MOV M,A
		C971 16 80	0102 MVI D,80H RATE OF BLINKS
		C973 13	0103 INX D
		C974 14	0104 INR D SET FLAGS
		C975 15	0105 DCR D
		C976 C2 73 C9	0106 JNZ \$-6
		C979 CD 1F C0	0107 CALL SINP WAIT FOR ANY CHARACTER
		C97C CA 6D C9	0108 JZ LOOP
		C97F	0109 *
		C97F FE 80	0110 CPI 80H MODE SELECT?
		C981 CA C9 C1	0111 JZ COMND BACK TO SOLOS
		C984 3A 09 C8	0112 LDA LINE OTHERWISE
		C987 FE 07	0113 CPI 7 RESTART LINE
		C989 3E 01	0114 MVI A,1 AND BE NEAT.

(Continued on page 9)

MEMORY SEARCH UTILITIES FOR SOL

(Continued from page 8)

```

C98B FA 91 C9      0115      JM      $+3
C98E 32 09 C8      0116      STA     LINE
C991 E1             0117      POP     H
C992 D1             0118      POP     D
C993 C9             0119      RET     .      TO NEXTC OR NEXTN
C994             0120 *
C994 23             0121 SINX INX     H
C995 3E FF          0122      MVI     A,0FFH  LAST ADDRESS IN 'L'
C997 BD             0123      CMP     L
C998 C0             0124      RNZ
C999 BC             0125      CMP     H      LAST ADDRESS IN H (SAME)
C99A C0             0126      RNZ
C99B C3 C9 C1      0127      JMP     COMND  BACK TO SOLOS
C99E             0128 *
C99E 1A             0129 DMP  LDAX   D      FROM TEXT..
C99F 77             0130      MOV     M,A     TO SCREEN
C9A0 13             0131      INX     D
C9A1 23             0132      INX     H
C9A2 7C             0133      MOV     A,H
C9A3 FE D0          0134      CPI     0D0H  LAST ADDRESS
C9A5 C2 9E C9      0135      JNZ     DMP
C9A8 C9             0136      RET
C9A9             0137 *
C9A9             0138 * LOCATE ONE HEXADECIMAL NUMBER (TWO ASCII)
C9A9             0139 *
C9A9             0140 * ON SCREEN: ADDRESS OF HEX NUMBER
C9A9             0141 * (BLINKING) HEXADECIMAL NUMBER
C9A9             0142 *
C9A9 CD 3A C3      0143 FNUM  CALL   SCONV  GET NUMBER
C9AC 55             0144      MOV     D,L
C9AD CD D5 C0      0145      CALL   PERSE
C9B0 7A             0146      MOV     A,D
C9B1 CD ED C3      0147      CALL   0C3EDH  PRINT NUMBER
C9B4 21 FF FF      0148      LXI     H,-1   START AT 0
C9B7             0149 *
C9B7 E5             0150 NEXTN  PUSH   H      PREPARE RETURN ADDRESS
C9B8 21 B7 C9      0151      LXI     H,NEXTN
C9BB E3             0152      XTHL   .      DONE.
C9BC CD 94 C9      0153 NXTN  CALL   SINX   INCR. HL & CHECK MEMORY
C9BF 7E             0154      MOV     A,M
C9C0 BA             0155      CMP     D
C9C1 C2 BC C9      0156      JNZ     NXTN
C9C4 D5             0157      PUSH   D      SAVE DATA
C9C5 C3 55 C9      0158      JMP     HERE   NEXT OCCURRENCE
C9C8             0159 *
C9C8             0160 * DUMPS MEMORY TO SCREEN
C9C8             0161 * ENTER ADDRESS IN HEXADECIMAL
C9C8             0162 *
C9C8 21 1C C8      0163 SCRN  LXI     H,0C81CH  BUFFER
C9CB 06 03          0164      MVI     B,3
C9CD CD 6E C4      0165      CALL   0C46EH  GET NAME
C9D0 CD 3A C3      0166      CALL   SCONV  GET ADDRESS
C9D3 E5             0167      PUSH   H
C9D4 E5             0168      PUSH   H
C9D5 CD D5 C0      0169      CALL   PERSE   CLEAR SCREEN
C9D8 16 04          0170      MVI     D,4
C9DA 21 1B C8      0171      LXI     H,0C81BH  BUFFER -1
C9DD CD 6A C5      0172      CALL   0C56AH  PRINT IT
C9E0 E1             0173      POP     H
C9E1 CD E8 C3      0174      CALL   ADOUT
C9E4 CD 36 C1      0175      CALL   0C136H  REMOVE CURSOR
C9E7 E1             0176      POP     H

```

```

C9E8             0177 *
C9E8 EB             0178      XCHG   .      INTO D-E
C9E9 AF             0179      XRA     A
C9EA 32 09 C8      0180      STA     LINE  SET POINTER
C9ED 3E 04          0181      MVI     A,4
C9EF 32 08 C8      0182      STA     LINE-1
C9F2 21 40 CC      0183      LXI     H,0CC40H  ACTUAL TRANSFER..
C9F5 CD 9E C9      0184      CALL   DMP    ON SCREEN
C9F8 31 FF CB      0185      LXI     SP,0CBFFH
C9FB 3A 07 C8      0186      LDA     0C807H
C9FE F5             0187      PUSH   PSW
C9FF C3 D7 C1      0188      JMP     0C1D7H  EXIT WITH 'MODE-SELECT'
CA02             0189 *
CA02             0190 * CLEAR MEMORY
CA02             0191 *
CA02 21 00 00      0192 CLEAR  LXI     H,0     FROM ADDRESS..
CA05 36 20          0193 MORE   MVI     M,20H   SPACES
CA07 23             0194      INX     H
CA08 7C             0195      MOV     A,H
CA09 FE C0          0196      CPI     0C0H   END OF MEMORY: 48K
CA0B C2 05 CA      0197      JNZ     MORE
CA0E C3 C9 C1      0198      JMP     COMND  DONE.
CA11

```

```

C900 21 3C C8 11 11 C9 1A 77 23 13 B7 C2 06 C9 C3 C9
C910 C1 46 43 22 C9 46 4E A9 C9 53 43 C8 C9 43 4C 02
C920 CA 00 CD 1B C3 EB 56 23 5E CD D5 C0 42 CD 19 C0
C930 43 CD 19 C0 CD 06 C4 21 FF FF E5 21 3A C9 E3 CD
C940 94 C9 7E E6 7F BA C2 3F C9 CD 94 C9 7E E6 7F BB
C950 C2 42 C9 D5 2B E5 E5 CD 06 C4 CD E8 C3 E1 7C D6
C960 01 57 5D 26 CE 2E 00 CD 9E C9 21 00 CF 7E EE 80
C970 77 16 80 13 14 15 C2 73 C9 CD 1F C0 CA 6D C9 FE
C980 80 CA C9 C1 3A 09 C8 FE 07 3E 01 FA 91 C9 32 09
C990 C8 E1 D1 C9 23 3E FF BD C0 BC C0 C3 C9 C1 1A 77
C9A0 13 23 7C FE D0 C2 9E C9 C9 CD 3A C3 55 CD D5 C0
C9B0 7A CD ED C3 21 FF FF E5 21 B7 C9 E3 CD 94 C9 7E
C9C0 BA C2 BC C9 D5 C3 55 C9 21 1C C8 06 03 CD 6E C4
C9D0 CD 3A C3 E5 E5 CD D5 C0 16 04 21 1B C8 CD 6A C5
C9E0 E1 CD E8 C3 CD 36 C1 E1 EB AF 32 09 C8 3E 04 32
C9F0 08 C8 21 40 CC CD 9E C9 31 FF CB 3A 07 C8 F5 C3
CA00 D7 C1 21 00 00 36 20 23 7C FE C0 C2 05 CA C3 C9
CA10 C1

```

RELOCATING CASSETTE ALS8 (REVISION B) BY JOE MAGUIRE

In the last issue of Solus News, I suggested a correction to the article on relocating ALS8. As it turns out, the stack pointer wasn't the problem. What really thwarted my attempts to relocate ALS8 from John Osudar's excellent article was that I have the revision B version which is somewhat different than the original. Following are the necessary corrections to apply if you have this version.

Begin by referring to the original article. (Solus News Vol. 1 No. 3)

1. Change the first block to be relocated from DF80-E3E5 to 0E00-E3E5.
2. In step (3) the three byte entries begin at FA62 and continue to FA9A.
3. Change the following bytes in the initializing routine as listed below. (all addresses reference the original location and must be offset accordingly) The value in parenthesis is given as an example assuming you are relocating to address 5000 hex.

```
DF1C  this byte must be set to one less than the high-order byte
      of the start of the ALS8 RAM area. (4F)
DF22  high-order byte plus 03. (53)
DF60  high-order byte plus 0F. (5F)
DF69  " " (5F)
DFA2  " " (5F)
DFA4  " " (5F)
DF6A  change to E1. (E1)
DFA3  " " (E1)
```

The checksum routine will cycle through the entire memory until 0000 is reached. This may cause some delay in addition to unpredictable results upon other programs in memory. To disable the checksum test, patch a jump from address DE11 to DE20. If the checksum is desired, a routine such as given below must be patched into the RAM area which will halt the test at the end of the relocated ALS8. Otherwise the checksum value will be unreliable. The correct value can be found stored at DE03-DE04 after the initialization has completed. Patch this value into the same address in an uninitialized copy and then save it.

	OLD		NEW
0E1A	23 7C B5		CD 20 (50) CALL HALT TEST
	HALT TEST	()	means high-order byte goes here
(50)20	23	INX H	
(50)21	7C	MOV A,H	
(50)22	FE (80)	CPI high-order byte + 30	
(50)24	C9	RET	

Each time the ALS8 is initialized it clears the system global area which includes the custom command table. If it is desired to leave some custom commands stored permanently on the file copy, then the clearing routine must be disabled. This can be accomplished by putting a NOP (00) at location DF1F.

If the ALS8 is loaded from some medium other than cassette tape, a disk system for example, then the HL register must be set the same as it would by Solos or Cuter or the I/O drivers will not initialize properly. A suggested format for use with the Northstar minidisk is given below.

```
(50)00 21 00 00 set HL to Solos
(50)03 03 00 (5E) jump to initializing routine
```

In this example, the file can be saved on the disk starting from 5000 for a length of 48 blocks. It can then be executed anytime with the Northstar DOS "GO" command after setting it as a type 1 file with a GO address of 5000.

As a final note, the ALS8 application notes available from Processor Technology contain a wealth of information about this program. Included in the price is an attractive blue binder. Until I obtained my Helios disk system, the ALS8 was the most used program in my library. (The Helios software essentially duplicates the ALS8 The Simulator, in particular, helped me write relocators for both the Northstar DOS and Basic. Anyone interested?

USING THE ELECTRIC PENCIL (VERSION SVN) WITH HELIOS BY JOE MAGUIRE

The Electric Pencil word processor by Michael Shroyer software is one of the more popular programs in use but it does present some problems when trying to use it with a Helios disk system.

When the Electric Pencil initializes itself, it zeros all remaining contiguous memory effectively preventing any other program from coexisting in memory at the same time. This leads to the perplexing paradox of attempting to load the Electric Pencil from Helios only to have it wipe out PTDOS and then, when trying to reboot, have Helios write over the area occupied by the Electric Pencil! A few rounds of this scenario is enough to make Murphy himself cry. Fortunately, there is a simple solution.

According to one dealer I spoke with, there are some 48 versions of the Electric Pencil in use. They are all basically similar differing mainly in the I/O routines. The bytes which require changing to make the program compatible with Helios should be somewhere near the same area in all versions. The version I have is designated SVN which means: Selectric, VGM, Northstar disk. The following change limits the RAM zeroed on initialization to 8000 hex. This fits nicely with the area required by PTDOS (9000-BFFF) and leaves room for a printer driver besides.

	OLD		NEW
001D	AF	XRA A	AF XRA A
001E	23	INX H	23 INX H
001F	77	MOV M,A	77 MOV M,A
0020	BE	CMP M	B4 ORA H
0021	CA 1E 00	JZ 001E	F2 1D 00 JP 001D

The Jump Plus instruction will continue the loop until the high bit in H equals one, i.e. 80H. Very convenient for our purpose. A second zeroing routine is located at 0A26 which is called after a program is loaded from the Northstar disk. You may want to change this one also if you are using the Electric Pencil with a Northstar but want to protect an area for a printer driver.

The control 0 command which reboots the Northstar disk can be changed to re-enter PTDOS by changing the bytes located at 011C-D from 00 E9 to B0 BC respectively.

Saving the text data with Helios is accomplished by use of the
(Continued on page 11)

USING THE ELECTRIC PENCIL (VERSION SVN) WITH HELIOS

(Continued from page 10)

PTDOS WRITE command saving from 2280 to the end of text address. (found at location 2283-4 in the SUN version) Loading the text back into memory is accomplished by READ <file>,2280 with PTDOS.

The correct saving and loading addresses as well as the location of the various pointer bytes in other versions can be located by means of some test programs and examination of memory contents with the Solos DUMP command.

Happy word processing!

(ED, NOTE: A VERSION TAILORED TO HELIOS IS AVAILABLE FROM MICHAEL SHRAYER SOFTWARE,)

AUTOMATIC RELOCATOR PROGRAM
BY JOE MAGUIRE

Automatic relocator program. Originally printed in Byte Magazine for July, 1977. Modified for Sol computer and Solos by Joe Maguire, 1978

```

C11C      0010 *
C019      0015 VDADD EQU 0C11CH
C01F      0020 SOUT EQU 0C019H
C310      0025 SINP EQU 0C01FH
          0030 PSCAN EQU 0C310H
          0035 *
C900      0000      ORG 0C900H
C900 31 FF CB      0040 BEGIN LXI SP,BEGIN+2FFH
C903 CD 48 CA      0045      CALL CRLF
C906 21 63 CA      0050      LXI H,MSG1
C909 CD 17 CA      0055      CALL PUT
C90C 22 56 CA      0060      SHLD SSTRT
C90F 21 8C CA      0065      LXI H,MSG2
C912 CD 17 CA      0070      CALL PUT
C915 22 58 CA      0075      SHLD SBOT
C918 21 84 CA      0080      LXI H,MSG3
C91B CD 17 CA      0085      CALL PUT
C91E 22 5A CA      0090      SHLD BTOP
C921 21 CA CA      0095      LXI H,MSG4
C924 CD 17 CA      0100      CALL PUT
C927 22 5C CA      0105      SHLD START
C92A 21 F4 CA      0110      LXI H,MSG5
C92D CD 17 CA      0115      CALL PUT
C930 22 5E CA      0120      SHLD STOP
C933 21 1D CB      0125      LXI H,MSG6
C936 CD 17 CA      0130      CALL PUT
C939 7D           0135      MOV A,L
C93A 32 60 CA      0140      STA FUNK
          0145 *
C93D 2A 58 CA      0150 MAIN LHL SBOT
C940 54           0155      MOV B,H
C941 5D           0160      MOV E,L
C942 2A 5A CA      0165      LHL BTOP
C945 44           0170      MOV B,H
C946 4D           0175      MOV C,L
C947 2A 56 CA      0180      LHL SSTRT
C94A C5           0185      PUSH B
C94B CD E3 C9      0190      CALL COMPH
C94E 19           0195      DAD D

```

```

C94F 44           0200      MOV B,H
C950 4D           0205      MOV C,L
C951 E1           0210      POP H
C952 09           0215      DAD B
C953 3A 60 CA      0220      LDA FUNK
C956 B7           0225      ORA A
C957 CA 74 C9      0230      JZ STEP3
C95A 1A           0235 X   LDAX D
C95B 77           0240      MOV M,A
C95C 78           0245      MOV A,B
C95D B7           0250      ORA A
C95E C2 66 C9      0255      JNZ Y
C961 79           0260      MOV A,C
C962 B7           0265      ORA A
C963 CA 6C C9      0270      JZ TEST
C966 2B           0275 Y   DCX H
C967 1B           0280      DCX D
C968 0B           0285      DCX B
C969 C3 5A C9      0290      JMP X
C96C 3A 60 CA      0295 TEST LDA FUNK
C96F FE 02         0300      CPI 02H
C971 CA 04 C0      0305 DONE JZ 0C004H
C974 E5           0310 STEP3 PUSH H
C975 62           0315      MOV H,D
C976 6B           0320      MOV L,E
C977 CD E3 C9      0325      CALL COMPH
C97A D1           0330      POP D
C97B 19           0335      DAD D
C97C 22 61 CA      0340      SHLD DISP
C97F 2A 5C CA      0345      LHL START
C982 2B           0350      DCX H
C983 23           0355 LOOP INX H
C984 EB           0360      XCHG
C985 2A 5E CA      0365      LHL STOP
C988 EB           0370      XCHG
C989 7B           0375      MOV A,E
C98A 95           0380      SUB L
C98B 7A           0385      MOV A,D
C98C 9C           0390      SBB H
C98D DA 04 C0      0395 DONE2 JC 0C004H
C990 06 1A         0400      MVI B,1AH
C992 11 EB C9      0405      LXI D,TAB3
C995 1A           0410 CHEK3 LDAX D
C996 BE           0415      CMP M
C997 CA B5 C9      0420      JZ ACT
C99A 05           0425      DCR B
C99B 13           0430      INX D
C99C C2 95 C9      0435      JNZ CHEK3
C99F 06 12         0440      MVI B,12H
C9A1 11 05 CA      0445      LXI D,TAB2
C9A4 1A           0450 CHEK2 LDAX D
C9A5 BE           0455      CMP M
C9A6 CA B1 C9      0460      JZ SKIP
C9A9 05           0465      DCR B
C9AA 13           0470      INX D
C9AB C2 A4 C9      0475      JNZ CHEK2
C9AC C3 83 C9      0480      JMP LOOP
C9B1 23           0485 SKIP INX H
C9B2 C3 83 C9      0490      JMP LOOP
C9B5 E5           0495 ACT  PUSH H
C9B6 2A 58 CA      0500      LHL SBOT
C9B9 54           0505      MOV D,H
C9BA 5D           0510      MOV E,L
C9BB 2A 56 CA      0515      LHL SSTRT
C9BE 2A 56 CA      0520      MOV B,H
C9BF 4D           0525      MOV C,L

```

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AUTOMATIC RELOCATOR PROGRAM

(Continued from page 11)

```

C9C0 E1          0530      POP   H
C9C1 23          0535      INX   H
C9C2 7B          0540      MOV   A,E
C9C3 96          0545      SUB   M
C9C4 23          0550      INX   H
C9C5 7A          0555      MOV   A,D
C9C6 9E          0560      SBB   M
C9C7 0A 83 C9   0565      JC    LOOP
C9C8 2B          0570      DCX   H
C9C9 7E          0575      MOV   A,M
C9CA 91          0580      SUB   C
C9CB 23          0585      INX   H
C9CC 7E          0590      MOV   A,M
C9CD 98          0595      SBB   B
C9CE 0A 83 C9   0600      JC    LOOP
C9CF 2B          0605      DCX   H
C9D0 E8          0610      XCHG H
C9D1 2A 61 CA   0615      LHLD DISP
C9D2 E8          0620      XCHG H
C9D3 7E          0625      MOV   A,M
C9D4 83          0630      ADD   E
C9D5 77          0635      MOV   M,A
C9D6 23          0640      INX   H
C9D7 7E          0645      MOV   A,M
C9D8 8A          0650      ADC   D
C9D9 77          0655      MOV   M,A
C9DA E3 83 C9   0660      JMP   LOOP
C9DB 7C          0665      COMPH MOV A,H
C9DC 2F          0670      CMA
C9DD 67          0675      MOV   H,A
C9DE 70          0680      MOV   A,L
C9DF 2F          0685      CMA
C9E0 6F          0690      MOV   L,A
C9E1 23          0695      INX   H
C9E2 A9          0700      RET
C9E3 09          0705 *
C9E4 01 11      0710 TAB3 DW 1101H
C9E5 21 22      0715      DW 2221H
C9E6 2A 31      0720      DW 312AH
C9E7 32 3A      0725      DW 3A32H
C9E8 C2 C3      0730      DW 0C3C2H
C9E9 C4 CA      0735      DW 0CAC4H
C9EA CC CD      0740      DW 0C0CCH
C9EB D2 04      0745      DW 0D402H
C9EC DA 0C      0750      DW 0C0DAH
C9ED E2 E4      0755      DW 0E4E2H
C9EE EA EC      0760      DW 0ECEAH
C9EF F2 F4      0765      DW 0F4F2H
C9F0 FA FC      0770      DW 0FCFAH
C9F1 09          0775 *
C9F2 06 0E      0780 TAB2 DW 0E06H
C9F3 16 1E      0785      DW 1E16H
C9F4 26 2E      0790      DW 2E26H
C9F5 36 3E      0795      DW 3E36H
C9F6 C6 CE      0800      DW 0CEC6H
C9F7 D3 D6      0805      DW 0D6D3H
C9F8 08 0E      0810      DW 0E0E8H
C9F9 E6 EE      0815      DW 0EEE6H
C9FA F6 FE      0820      DW 0FEF6H
C9FB 09          0825 *
C9FC 46          0830 PUT  MOV B,M
C9FD E5          0835      PUSH H
C9FE 9 C0       0840      CALL SOUT

```

```

CA1C E1          0845      POP   H
CA1D 23          0850      INX   H
CA1E 7E          0855      MOV   A,M
CA1F FE 00      0860      CPI   00H
CA21 C2 17 CA   0865      JNZ   PUT
CA24 CD 1C C1   0870      CALL UDADD
CA27 EB          0875      XCHG H
CA28 18          0880      DCX   D
CA29 CD 1F C0   0885 P1  CALL SINC
CA2C CA 29 CA   0890      JZ    P1
CA2F E6 7F      0895      ANI   7FH
CA31 FE 00      0900      CPI   00H
CA33 CA 30 CA   0905      JZ    P2
CA36 47          0910      MOV   B,A
CA37 CD 19 C0   0915      CALL SOUT
CA3A C3 29 CA   0920      JMP   P1
CA3D 06 20      0925 P2  MVI B,20H
CA3F CD 19 C0   0930      CALL SOUT
CA42 CD 10 C3   0935      CALL PSCAN
CA45 E5          0940      PUSH H
CA46 CD 4B CA   0945      CALL CRLF
CA49 E1          0950      POP   H
CA4A C9          0955      RET
CA4B 09          0960 *
CA4B 06 00      0965 CRLF MVI B,00H
CA4D CD 19 C0   0970      CALL SOUT
CA50 06 0A      0975      MVI B,0AH
CA52 CD 19 C0   0980      CALL SOUT
CA55 C9          0985      RET
CA56 09          0990 *
CA56 09          0995 * STORAGE AREA
CA56 09          1000 *
CA56 09          1005 SSTRT DS 2
CA58 09          1010 SBOT DS 2
CA5A 09          1015 DTOP DS 2
CA5C 09          1020 START DS 2
CA5E 09          1025 STOP DS 2
CA60 09          1030 FUNK DS 1
CA61 09          1035 DISP DS 2
CA62 09          1040 *
CA63 09          1045 * MESSAGE AREA
CA63 09          1050 *
CA63 46 49 52 53 1055 MSG1 ASC #FIRST ADDRESS OF BLOCK TO BE RELOCATED: #
CA64 54 20 41 44
CA65 44 52 45 53
CA66 53 20 4F 46
CA67 20 42 4C 4F
CA68 43 48 20 54
CA69 4F 20 42 45
CA70 20 52 45 4C
CA71 4F 43 41 54
CA72 45 44 3A 20
CA8B 00          1060      DB 00H
CA8C 4C 41 53 54 1065 MSG2 ASC #LAST ADDRESS OF BLOCK TO BE RELOCATED: #
CA8D 20 41 44 44
CA8E 52 45 53 53
CA8F 20 4F 46 20
CA90 42 4C 4F 43
CA91 48 20 54 4F
CA92 20 42 45 20
CA93 52 45 4C 4F
CA94 43 41 54 45
CA95 44 3A 20
CAB3 00          1070      DB 00H
CAB4 44 45 53 54 1075 MSG3 ASC #DESTINATION ADDRESS: #
CAB5 49 4E 41 54

```

(Continued on page

AUTOMATIC RELOCATOR PROGRAM

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```

49 4F 4E 20
41 44 44 52
45 53 53 3A
20
CAC9 00          1080      DB      00H
CACA 46 49 52 53 1085 MSG4  ASC    #FIRST ADDR IN NEW LOC TO FIX REFERENCES: #
54 20 41 44
44 52 20 49
4E 20 4E 45
57 20 4C 4F
43 20 54 4F
20 46 49 58
20 52 45 46
45 52 45 4E
43 45 53 3A
20
CAF3 00          1090      DB      00H
CAF4 4C 41 53 54 1095 MSG5  ASC    #LAST ADDR IN NEW LOC TO FIX REFERENCES: #
20 41 44 44
52 20 49 4E
20 4E 45 57
20 4C 4F 43
20 54 4F 20
46 49 58 20
52 45 46 45
52 45 4E 43
45 53 3A 20
CB1C 00          1100      DB      00H
CB1D 0A 00        1105 MSG6  DW      000AH
CB1F 20 20 20 20 1110      ASC    #
20 20 20 20
20 20 20 20
20 20 20 20
20 30 30 30
46 49 58 20
52 45 46 45
52 45 4E 43
45 53 20 4F
4E 4C 59
CB46 0A 00        1115      DW      000AH
CB48 46 55 4E 43 1120      ASC    #FUNCTION SELECT: 01=MOVE AND FIX REF.#
54 49 4F 4E
20 53 45 4C
45 43 54 3A
20 30 31 30
40 4F 56 45
20 41 4E 44
20 46 49 58
20 52 45 46
2E
CB6D 0A 00        1125      DW      000AH
CB6F 20 20 20 20 1130      ASC    #
20 20 20 20
20 20 20 20
20 20 20 20
20 30 32 30
40 4F 56 45
20 4F 4E 4C
59
CB8C 0A 00        1135      DW      000AH
CB8E 0A          1140      DB      0AH
CB8F 53 45 4C 45 1145      ASC    #SELECT: #
43 54 3A 20
CB97 00          1150      DB      00H
1155 *

```

NORTH STAR GOES DOUBLE DENSITY

A report on the new Double Density Micro Disk System
from North Star Computers

A great number of Sol owners have the North Star Micro Disk system which, until now, was available only in a single density version of about 90K byte capacity. An interview with Peter Midnight of North Star by Solus News answered many questions about the new double density models soon to be available.

SN: Can you describe your new system for us?

PM: The double density versions of the HORIZON and MDS systems each include: a new controller board capable of both double and single density recording, a new Shugart SA-400D minifloppy drive, a new DOS and an upgraded Basic.

SN: What about the capacity?

PM: Each double density diskette will have twice the former capacity: 180K bytes. The controller will handle up to four drives so that, when double sided drives become available from Shugart in early 1979, users can expect to access almost one and one half megabytes of on-line information. This is truly big system performance at mini disk prices.

SN: What must I do to be able to use double density with my present system?

PM: You must purchase the new controller board and have your drive modified for double density. All your single density diskettes can be read by the new system. Drives may be converted by taking them to your dealer or sending them to North Star. The cost for each drive modified will be \$145.00. Allow four to six weeks for modification.

SN: I have a dual drive system. Must I convert both drives?

PM: It's optional. In a multiple drive system, the double density drive must be selected as unit 1, but, other drives may be either single or double. Of course, only double density drives can write in that format but they are able to write in single density mode if so desired.

SN: Can I use the new DOS or Basic with my old controller?

PM: All of the on-board proms of the new controller have been changed so the old DOS will not work with the new controller nor will the new DOS work with the old one. The Basic is being upgraded to allow reading and writing in double density, if selected, and these features won't work, of course, if an attempt is made to use them with a single density controller or DOS.

SN: What about all my programs?

PM? All software written to conform to the standard entry points as used in the old DOS and all Basic programs without special calls to machine language subroutines within the DOS or controller prom area, should work. Vendor software, which contains its own DOS, will probably not work. North Star has provided information to Lifeboat Associates, the vendor of North Star compatible CPM, to enable them to modify the BIOS so that it will work with double density.

(Continued on page 14)

NORTH STAR GOES DOUBLE DENSITY

(Continued from page 13)

SN: Other than increased capacity on my disks, are there any other benefits of double density?

PM: Yes. The double density format is achieved by packing in more bytes per sector, actually 512 as opposed to 256 before. This means higher read/write speeds and consequently, less time for a given amount of data transfer. You should notice much faster operation.

SN: Are there any changes planned for the bootload address or software location?

PM: The boot start address will continue to be E900 in the standard version and is determined by the programming of the proms supplied with the controller board. Unlike the previous single density proms however, the sector load address will be software selectable. This means that, with a suitable software relocater, or custom origin software available from us, you may locate the DOS at any address you choose and not have to buy a special prom set to go with it. The controller will boot up the DOS to an address determined by a software byte stored on the disk.

SN: What about people who still want your single density controller? Are they going to be left out as far as supplies and support are concerned?

PM: No. North Star will continue to manufacture and support the single density controller. All of our software will continue to be offered in the single density format so as to be compatible with the many users who will continue with that equipment. Note that it is a simple matter, for a user with the new system, to convert a disk from single to double density. For that reason,

most software vendors should continue to offer their products in single density format also.

SN: How can I tell if some advertisement is referring to single or double density?

PM: To avoid confusion, the single density disk products are renamed with an S included in the product name. The double density will have a D in the name. There will be no single density additional drives offered; all drives delivered after mid November will be double density even if ordered for use in a single density system.

SN: What about availability and price?

PM: The double density equipment will be available in mid November. The price will be the same as has been for single density. The double sided drives should be available in early 1979. The price of these has not been determined yet.

SN: Are there any plans to offer some sort of conversion kit so that I may use parts from my present single density controller, the IC's for example, to build a double density kit?

PM: No, not at this time.

SN: Well, Peter, thanks and good luck with your new products.

PM: Thank you. We are very proud of these new products, and believe that they will find acceptance which exceeds the outstanding success of our initial single density HORIZON and MDS systems. Good luck to Solus News.

LETTERS

JUNE 23, 1978

DEAR MR. SOKOLOV AND MEMBERS:

I NOTE THAT FRED SALUNA IS HAVING TROUBLE WITH HIS EXPANDOR PRINTER. MY EXPERIENCE HAS BEEN THAT I WAITED 14 OR 15 WEEKS TO RECEIVE THE UNIT AND HAVE BEEN USING IT ABOUT A WEEK.

THE INTERFACE INSTRUCTIONS IN THE EXPANDOR MANUAL REFERS TO DATA LINE 1 - 7, WHICH SHOULD BE PAIRED WITH THE PARALLEL OUTPUT DATA LINES. THE POD ON THE J2 CONNECTOR OF SOL, FOR EXAMPLE DATA LINE 1 GOES TO J2 TERMINAL 25 WHICH IS POD0, AND DATA LINE 2 TO J2 TERMINAL 24, WHICH IS POD1, AND SO ON. IN ADDITION, IT IS NECESSARY TO RESTRAP THE STROBE ON THE EXPANDOR BY CUTTING BETWEEN J8 AND J7, AND ADDING A STRAP FROM J8 TO J6.

FURTHER COMMENTING ON THE EXPANDOR, THERE IS A LINE SWITCH THAT SUPPOSEDLY WILL INSTIGATE CARRIAGE RETURN AT THE END OF THE LINE. UNFORTUNATELY, THE BOARD HAS NO WIRES, WHERE THE SWITCH TIES IN, SO ONE MUST BE CAREFUL THAT A CARRIAGE RETURN IS INSTITUTED AT LEAST EVERY 80 SPACES BY SOFTWARE AND FINALLY, IN MY EXPANDOR, THE RIBBON REVERSE IS NOT WORKING, UNLESS I HELP MANUALLY.

THIS LETTER IS BEING TYPED ON MY EXPANDOR USING MY NORTHSTAR BASIC.

YOURS VERY TRULY,

BERNARD PLOTKIN
3120 COLLINS AVENUE
MIAMI BEACH, FLORIDA, 33139

P.S. I WOULD BE GLAD TO HELP IN ANY WAY I CAN BOTH THE CLUB AND ANY MEMBERS.
READY

ON MICROPOLIS INTERCHANGE

Micropolis Users:

I am interested in setting up a Micropolis/Sol users group for exchanging information, software, and application ideas. Although the Dual density and Quad density Micropoli don't match or mix (believe me we have tried, but Micropolis finally admitted that the two are and will remain incompatible), software can be transferred via Cuts tapes.

Robert van Spyk
Geography Department
University of Hawaii at Hilo,
Hilo, Hawaii 96720

Fr. Thomas McGahee



Don Bosco Technical High School

202 UNION AVENUE, PATERSON, NEW JERSEY 07502

Telephone: (201) 278-8800

August 30, 1978

Dear Mr. Stan Sokolow,

Some time back you sent me a complimentary copy of SOLUS NEWS after receiving a letter from Maury Goldberg of Mini Micro Mart in Syracuse, N.Y. I found the newsletter most interesting and informative, and am eager to continue receiving it (and obtaining all back issues if at all possible). Our computer club here at Don Bosco Tech has over 40 members, and we are quite active both in Assembly Language and BASIC programming. Unfortunately we operate on a shoe-string budget and cannot subscribe to all the publications we would like to. Since I cannot pay for a subscription, I thought I would do the next best thing and write something you could use in your newsletter. I think you and other SOL users will find the memory search routines quite handy to have around! We developed these a few months back to aid us in modifying and debugging software... they make extensive use of the routines found in the SOLUS module.

To aid you in evaluating this program, I am including a cassette tape (for you to keep) with the program (SRCH) on it. There is also ASSM, the ALS-8 assembler file on the tape, and a program called LIST. LIST can be used to get a printed, assembled listing. Once LIST is loaded just type EX 200, and the listing will commence on device #1. (To change the listing device, change the data at 20B to the appropriate device number). This material is offered to you on a non-exclusive basis...copies have also been sent to ACCESS and PEOPLE'S COMPUTERS, since I would like to make the program available to as many SOL users as possible.

Sincerely yours,
Fr. Thomas McGahee

ON N* USERS GROUP

4624 Itasca
Lubbock, Texas 79416
September 3, 1978

Dear Stan,

The newsletter is great!! Keep it up. The reduction is okay but since I keep mine in a ring binder I prefer the layout of Vol. 1, No. 3. It makes it much easier to refer to later on. I joined NSUGS a while back but have not heard a peep out of them since receiving Vol. 1 #1 back in April. I sent in a program to their library and have not heard a word or gotten my disk back despite two letters to Dick Milewski whom I sent the disk to. I guess it's gone for good. Plus, now they are selling programs from the library but I don't know of anyone who has ever gotten one in exchange for sending in a program. Do you? If this sounds like sour grapes it is because disks and postage don't come cheap.

I would be interested in hearing from anyone who knows about the following:

I/O patches for 8080 Simulator by Lee Stork in the Sept, 1977 Kilobaud;
Pilot from Dr. Dobbs patched to run on Sol/North Star disk;
MSA Basic patched to the N* so you can load and save programs on disk.

My novice standing as an assembly language programmer is becoming a handicap in acquiring and operating some very interesting software. I've seen the PT Pilot on cassette but refuse to get involved with it unless and until someone patches it to Northstar. Most of the people I've met in Lubbock are hardware types and the software pros are too busy to get involved in such mundane projects.

As a satisfied user I would like to recommend the software distributed by:

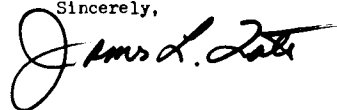
Microcomputer Resources, Inc.
3000 Medical Park Drive
Suite 107
Tampa, FL 33612
Tel 813-977-5940

They offer several different special purpose I/O drivers tying the SOLOS operating system to the North Star DOS. Their package #6 for \$40.00 is an I/O driver to allow transfer of data from North Star to Helios. Their package #1 for \$10.00 ties the SOL cursor control keys to the N* Basic text editor. The handiest feature of this package I've found is that you can stop the screen display with the space bar. Pressing the space bar adds one line and touching any other key restarts the display. The service on my order was fast and the price is reasonable. The supporting documentation was excellent.

Along these same lines the DOS and Basic movers being distributed by the Digital Dell, 80 West El Camino Real, Mountain View, CA 94041 are excellent pieces of software. Any serious N* user should have this package.

Will the SOLUS library distribute programs on diskettes? When? Is the catalog available yet? I would be interested in hearing from anyone out there in SOLUS land who has N* software to sell/swap or whatever.

Sincerely,



(ED, NOTE: I THINK THE COMPANY YOU MENTION HAS A PACKAGE WHICH LETS PTC CASSETTE SOFTWARE SUCH AS PILOT RUN UNDER NORTH STAR DOS. IT'S GENERAL PURPOSE SO IT WORKS WITH ALL SOLOS/CUTER PROGRAMS. ABOUT SOFTWARE ON DISKETTES--YES, BUT I STILL AM WORKING ON ARRANGING FOR N* DISKETTES, INITIALLY ONLY HELIOS.)

ON PTC MEMORY, SQUARE ROOT, AND NEW PRODUCTS

Joseph A. Maguire
1-72 Horinouci
Yokohama, Japan 233

Sept. 5, 1978

Dear Stan,

Please delete the item about the ALS8 in my previous letter. It turns out that the problem was not in the relocater but in my memory. During the relocation process a few memory bytes got messed up and caused strange things to happen to the new ALS8.

PTC MEMORY BOARDS A recent conversation with PTC over some memory (16KRA) problems elicited the following cautions: Do not substitute parts in an attempt to find the trouble in a malfunctioning memory board. Every IC is selected according to a rigid checkout procedure. Changing ICs from one board to another or even on the same board can cause more problems than it will correct. Dealers will soon have the alignment procedure so take a malfunctioning board to them for checkout. The 32KRA memory board comes in two versions. The memory chips will either be "high" or "low". The chip, a 2108, is actually a 16K part with a bad bit in either the high or low 8K segment. This is not poor quality but in fact a cost saving method used by many memory board manufacturers. These 16K rejects are capable of normal performance in an 8K environment at a considerable saving. The important thing is that a "high" cannot be substituted for a "low" or vice versa. The chip will be marked with its gender by an A6H or A6L following the type number.

Note: The long memory test in the 16KRA manual may be patched to test a board at any address. Change the byte at 0010 (0910 if you have a version starting at C900) to agree with the high byte of the first page of memory to be tested. For example, to test a board addressed from 4000 to 7FFF, ENTER 40 at location 0010.

FLAT SQUARE ROOT A bug seems to be present in the SQR function of extended cassette Basic. If the argument of the function happens to consist of eight digits, truncation of the leftmost digits sometimes results and the wrong answer is returned. For example, SQR(99.999999) will return 1 instead of some number close to 10. The error occurs whether the argument is a constant or a variable.

Sincerely,



Joseph A. McGuire

1-72 Horinouchi
Yokohama, Japan 232

PO Box 3742
Anchorage, AK 99510

October 12, 1978

Dear Stan,

I received your notice that my remarks had already been submitted for printing in Solus News. Sorry about the omission in my item on the ALS8 but I was eager to get the news out. Next time I'll check more carefully. The correction won't hurt but it was unnecessary. Enclosed is a complete analysis of the problem. Also enclosed is a note to enable the Electric Pencil word processor to be used with Helios.

After reviewing what I had written about the ALS8, I decided to give you a copy of my modifications to Leon Zolman's automatic code relocater program which appeared in Byte magazine for July, 1977. This has proven to be one of the most popular programs in use by the Sol owners here in Japan. I have used it to relocate ALS8, Northstar DOS, Northstar BASIC, XEK and DISassembler Plus others. Feel free to put it in the Solus library (if it's OK with Byte) or print it in Solus News.

What follows are a few notes of interest.

NO MORE S-100 BOARDS: A spokesman at Processor Tech told me that effective immediately PTC will stop manufacturing all S-100 boards except their "N"KRA memory. This includes the popular VDM, CUTS, 3P+S, GPM and the 16KRA memory board. The reason was given that PTC wants to concentrate entirely on "application systems". An application system was defined as a Sol computer, Helios disk and Diablo printer. Their first such system is centered around a word processing software package and was shown at the Philadelphia computer show. Since PTC first got started by building S-100 accessories this appears to be the end of an era.

"N"K MEMORY Beginning immediately PTC will be offering their new memory board which was described as being completely redesigned. It is a single, S-100 board which can be configured in 16K blocks to a total of 64K of dynamic RAM. Recent Sols have been shipped equipped with this board. (A comment by a dealer but not confirmed with PTC was that Sols can now be ordered without any memory installed)

COLOR GRAPHICS While nosing around Pleasanton I caught wind of a color graphics system which will be announced on the cover of the November Popular Electronics magazine. Also sniffed, but faintly, was that a minidisk is in the works to be available sometime next year. It will offer a subset of Helios software. Now if only PTC would offer a Sol 40 with a Z80 CPU wow!

64K STATIC RAM Continuing my tour through Silicon Gulch, I happened upon one company and a design engineer hard at work on a new, one-board, 64K, static RAM. To show you how hot this news is, the go-ahead from management to start the design had only been given that morning! I was quickly hustled out of there and sworn to secrecy but not before I got the promise that the design would be checked for compatibility with the Sol and Helios. The exciting thing about this board, for Sol owners, is that the total power requirement for a full 64K of chips installed will be only one amp. That puts it in direct competition with the dynamics. The price will be very good too, I was told. I am to get a prototype for testing with my system and I'll give a report on it for Solus News.

???????????? In another corner of the design area at the above company (which is noted for it's S-100 bus products) sat a stripped Radio

Shack TRS-80 computer. Now, what do you suppose they were doing with that? My guess is that they were hard at work on a TRS-80/S-100 bus adapter. If you think you have seen a lot of S-100 bus products, wait until a successful adapter becomes available which will open up the market for a million more prospective customers!

SICK SOL After more than a year of faithful service from my trusty Sol, it suddenly started doing strange things. Programs would halt in mid execution for no apparent reason. RESET would sometimes work - sometimes not. Time to take off the cover. What I found were loose IC's. Yes, apparently the many temperature cycles of turning on and off worked those IC's out of their sockets just like rocks coming out of the ground after the spring thaw. Some judicious pressing got things back in working order. I have heard that the boards installed in the backplane can do the same thing.

60000 ATTEND SHOW Last week saw the conclusion of the five day data processing show here in Japan. Just over 60,000 attended to view the latest products available from countries around the world. The United States was well represented by most of the major companies including IBM, DEC and Control Data to name a few. The micros held a lions share of the exhibit space with big displays by Commodore (PET) and Tandy (Radio Shack TRS-80). Processor Technology was represented by their dealer in Tokyo: Moonbase Store, Shinjuku. The Japanese are coming along well in their development of micros but have not, as yet, gotten the prices down to be a serious threat to US imports. If you wondered why it took so long to get a PET in the USA last summer or are still waiting for level II basic for your TRS-80, the reason is that about 80% of the supply is being exported. Eighty percent of the TRS-80s sold in Japan are equipped with level II basic. One dealer in Yokohama told me he has sold a average of 110 units per month for the last three months. Returning to the data show, the one impression that I came away with is that the 8080 processor is losing ground in favor of the Z80. The 6502 seems to be the other favorite due in large part to its use in the PET and Apple. (Apple is also a big seller in Japan) When the Japanese make their big move in the personal computer market, my bet is that it will be either with the 6502 or Z80 and some redesigned bus to go with it. The new 16 bit chips coming out will probably be too expensive and too powerful for a home appliance type product.

SPECIAL ITEM A word to any dealers or manufacturers reading this: If you have not considered exporting your products you are missing a tremendous market. The dollar was never in a better position to make US products competitive overseas. If you don't know the ropes, contact the US Dept. of Commerce. They will send you pounds of free literature on how to get started. A special note to software vendors. Many Japanese have asked me for software, software, software! It makes no difference that it is written in English but it must work. Especially wanted are business application programs - no games please. Some smart US companies are advertizing in the Japanese computer magazines and getting good results. Below are listed two magazines which have carried US advertizing. They will translate the copy into Japanese for you. The usual requested form of payment in the ads is by US dollar check.

ASCII magazine (roughly equivalent to Kilobaud)
305 HI TORIO
5-6-4 Minami Aoyama,
Minato-Ku, Tokyo 107 Japan

I/O magazine (somewhat akin to Byte)
Haneda Building 507
2-5-1 Yoyogi
Shibuya-Ku, Tokyo 151 Japan

Joe McGuire

October 21, 1978

ON LOTS OF THINGS

Dear Stan,

Here is the result of my visit to North Star this week. Feel free to put it in Solus News.

Some additional notes about the items I already submitted.

1. PTC's new color graphics system will be named CORONA.
2. PTC's new word processing system will be named WORD WIZARD.
3. PTC will continue to manufacture the GPM Sol S-100 board.

New Info:

A new release of PTDOS is in the works. It will be called PTDOS 1.5 and will contain several new commands including one called HELP. HELP is essentially the instruction manual written into a file but with much clearer terms and examples. A majority of the remaining files, which were in PTDOS 1.4, have been extensively modified to take out the bugs, allow more freedom of operation and to give faster execution. All in all, PTDOS 1.5 is practically a brand new DOS.

Software updates have been completed on the following programs which will be released to dealers shortly. All will have new manuals available.

Extended Cassette Basic
Disk Basic
Fortran
PTDOS 1.5 (new)



3027 Olive Road
Homewood, IL 60430
October 20, 1978

Dear Stan:

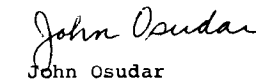
As long as you and SOLUS members retain control, the "future of SOLUS News" should be excellent. Let PT produce it; they certainly aren't busy turning out copies of Access! Note to Joseph A. Maguire: I haven't looked at the SP problem with ALS8, because mine worked fine after relocation; maybe ALS8 uses whatever stack you give it (in which case mine uses the SOLOS stack.) Thanks for your kind words and for making me aware of the problem. I have managed to answer my question from last time (about Dynabyte 32K static memory in SOL) by purchasing the board and trying it. I got the 450ns version from MiniMicroMart (Syracuse, NY) for \$740. It works like a charm (a slightly warm one) and the increased memory capacity really makes ALS8 and ECBASIC useful!

Some notes on software:

Ben Milander is right. DDS (Dynamic Debugging System) is very good, and the price (\$30 from Computer Mart of New Jersey) is right; also, they deliver the goods quickly. The Electric Pencil may be overpriced at \$100, but is generally an excellent product. Tiny-C, a language interpreter system from Tiny-c Associates, PO Box 269, Holmdel, NJ 07733, is a good idea. In spite of unjustified criticism from a certain publication (namely Computerworld), it's not the idea that is deficient, but rather the end product. There appear to be minor and/or major bugs in the system version I received for my \$30. The manual, sold for \$40 and including source listings, is excellent. I hope the Tiny-c people put some more effort into this; it's worth the trouble.

I am typing this letter on a Carterfone G15C data terminal, which I am in the process of hooking up to the serial port on my SOL. I had some shipping trouble with this thing (purchased from Dal-Data in Dallas for \$495 refurbished), but now it's in top shape. It should go great with that Electric Pencil software from Michael Shrayer. How many people have seen the Micropolis MegaFloppy brochure? This looks like a fantastic mass storage system (924K per 5 1/4" diskette!) except Micropolis is selling the drives without software (\$645 per drive, \$410 for the controller, or \$2495 for controller + 2 drives). Maybe they (or somebody else? PT, are you listening???) will put a package together that will outperform Helios at a comparable or lower price. Well, maybe next year... That's all for now, Stan. Good luck, and don't let the work wear you down.

Sincerely,



John Osudar

(ED. NOTE: SEE ARTICLE IN VOLUME ZERO OF SOLUS NEWS ON HOW TO MAKE SOL SERIAL PORT GIVE THE RIGHT BAUD RATE, ETC., TO ANY 2741 TYPE TERMINAL, LIKE THE CARTERFONE.)

(Continued from page 19)

```

0000      1460 BOUT EQU 0C3F7H
0000      1470 SOUT EQU 0C019H
0000      1480 CUTAB EQU 0C830H
0000      1490 *
0000      1500 *WHEN EXECUTED AT 0B00, THE ROUTINE
0000      1510 *CREATES ENTRIES FOR BOTH OF ITS PARTS
0000      1520 *IN THE SOLOS/CUTER CUSTOM COMMAND
0000      1530 *TABLE, OVERWRITING THE FIRST TWO
0000      1540 *EXISTING ENTRIES, IF ANY.
0000      1550 *THE TWO COMMANDS ARE DISPLAYED ON
0000      1560 *THE SCREEN FOR CONFIRMATION.
0000      1570 *
0000      1580 ENTER EQU $
0000      1590 ORG 0C800H      SOLOS 1K RAM AREA
CB00 21 46 49      1600 LXI H,'FI'      COMMAND 'FI', REVERSED
CB03 22 3C C8      1610 SHLD CUTAB      SET UP FIRST COMMAND
CB06 21 1F CB      1620 LXI H,FILL      EX ADDRESS
CB09 22 3E C8      1630 SHLD CUTAB+2
CB0C 21 41 44      1640 LXI H,'DA'      SECOND COMMAND 'AD'
CB0F 22 40 C8      1650 SHLD CUTAB+4
CB12 21 3F C8      1660 LXI H,ADJMP      IT'S EX ADDRESS
CB15 22 42 C8      1670 SHLD CUTAB+6
CB18 21 8B CB      1680 LXI H,MSG
CB1B CD 7F CB      1690 CALL SCRNI      ECHO COMMANDS TO SCREEN
CB1E C9          1700 RET          THRU WITH SETUP
CB1F          1710 *
CB1F          1720 FILL EQU $
CB1F CD 78 C3      1730 CALL SCONV      GET START ADDR
CB22 E5          1740 PUSH H
CB23 CD 78 C3      1750 CALL SCONV      GET END ADDR
CB26 E5          1760 PUSH H
CB27 21 00 00      1770 LXI H,0          SET UP FOR PSCAN
CB2A CD A5 C3      1780 CALL PSCAN      GET CHAR, OR KEEP 0
CB2D 45          1790 MOV B,L          SAVE CHAR
CB2E          1800 *NOW GET BACK ADDRESSES
CB2E D1          1810 POP D          END ADDR
CB2F E1          1820 POP H          START ADDR
CB30          1830 LOJP EQU $
CB30 70          1840 MOV M,B          PUT CHAR IN MEM
CB31 7C          1850 MOV A,H          IS CURRENT ADDR
CB32 BA          1860 CMP D          EQUAL END ADDR?
CB33 DA 3B CB      1870 JC LOJPI          NO, SO GO ON
CB36 7D          1880 MOV A,L          TRY LOW ORDER BYTE
CB37 83          1890 CMP E
CB38 D2 04 C0      1900 JNC RETRN      ALL THRU
CB38          1910 LOJPI EQU $
CB38 23          1920 INX H
CB3C C3 30 CB      1930 JMP LOJP
CB3F          1940 *
CB3F          1950 *
CB3F          1960 ADJMP EQU $
CB3F CD 78 C3      1970 CALL SCONV      GET START ADDR
CB42 E5          1980 PUSH H          SAVE
CB43 CD A5 C3      1990 CALL PSCAN
CB46 D1          2000 POP D
CB47 EB          2010 XCHG          HL=START,DE=END
CB48 CD 42 C3      2020 DLOOP CALL CRLF
CB4B CD 09 C3      2030 CALL ADOUT
CB4E CD F7 C3      2040 CALL BOUT
CB51 0E 10          2050 MVI C,10
CB53 7E          2060 DLP1 MOV A,M
CB54 C5          2070 PUSH B
CB55 FE 20          2080 CPI 20H      < BLANK?
CB57 D2 5C CB      2090 JNC DOWN

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CB5A 3E 2E      2100 MVI A,'.'      YES, MAKE DOT
CB5C FE 7F      2110 DOWN CPI 7FH      >= 7FH?
CB5E DA 63 CB      2120 JC DN1          NO
CB61 3E 2E      2130 MVI A,'.'      YES, MAKE DOT
CB63 47          2140 DN1 MOV B,A
CB64 C3 19 C0      2150 CALL SOUT      SEND CHAR OUT
CB67 06 20      2160 MVI B,' '
CB69 CD 19 C0      2170 CALL SOUT      SEND OUT SPACE
CB6C 7D          2180 MOV A,H          NOW SET IF FINISHED
CB6D 3A          2190 CMP D
CB6E DA 76 CB      2200 JC DLP1A
CB71 7D          2210 MOV A,L
CB72 36          2220 CMP E
CB73 D2 04 C0      2230 JNC RETRN      ALL THRU
CB76          2240 DLP1A EQU $      CONTINUE
CB76 C1          2250 POP B
CB77 23          2260 INX H          FIX POINTERS
CB78 0D          2270 DCR C
CB79 C2 53 CB      2280 JNZ DLP1      MORE FOR THIS LINE
CB7C C3 48 CB      2290 JMP DLOOP      ELSE DO CRLF FIRST
CB7F          2300 SCRNI EQU $      SEND OUT MESSAGE
CB7F 7E          2310 MOV A,M          GET CHAR
CB80 FE F1      2320 CPI OFFH      TERMINATION CHAR?
CB82 C8          2330 RZ          YES - MSG FINISHED
CB83 47          2340 MOV B,A          CHAR TO B REG
CB84 CD 19 C0      2350 CALL SOUT      SEND IT OUT
CB87 23          2360 INX H          BUMP POINTER
CB88 C3 7F CB      2370 JMP SCRNI      DO AGAIN
CB88 *          2380 *
CB88          2390 MSG EQU $      INIT MESSAGE
CB8B 0D          2400 DB ODH      <CR>
CB8C 0A          2410 DB GAH      <LF>
CB8D 41 44 20      2420 ASC 'AD AND FI ENABLED'
CB9E F1          2430 DB OFFH      TERM CHAR

```

^TABLE
SYMBOL TABLE

```

SCONV C376      PSCAN C3A5      RETRN C004      ADOUT C3D9
CRLF C342      BOUT C3F7      SOUT C019      CUTAB C83C
ENTER 0000      FILL C81F      LOOP C830      LOOP1 C833
ADJMP C83F      DLOOP C848      DLP1 C853      DOWN C85C
DN1 C863      DLP1A C876      SCRNI C87F      MSG C883

```

^FILE
MTSYM 2000 3560
^ASSM J

```

0000      1000 *THIS PROGRAM IS A FOUR FUNCTION MEMORY TEST
0000      1010 *BASED ON A PROGRAM BY ROD HALLEN PUBLISHED
0000      1020 *IN THE JULY 78 ISSUE OF KILOBAUD MAGAZINE.
0000      1030 *
0000      1040 *THIS VERSION 10/78 BY LEWIS MOSELEY, JR.
0000      1050 *2514 GLENDALE CT., CONYERS, GA. 30207
0000      1060 *
0000      1070 *ALTERED TO ALLOW IT TO RUN AS A SOLOS/CUTER
0000      1080 *CUSTOM COMMAND. LOADS IN THE 1K SCRATCHPAD RAM
0000      1090 *
0000      1100 * COMMAND FROM SOLOS/CUTER HAS THE FORM
0000      1110 * MTEST ADDR LENG (NUMBER)
0000      1120 * WHERE 'MT' IS THE CUSTOM COMMAND NAME
0000      1130 * 'ADDR' IS THE START ADDRESS IN HEX
0000      1140 * 'LENG' IS THE NUMBER OF BYTES TO TEST
0000      1150 * 'NUMBER' IS A OPTIONAL NUMBER OF TIMES
0000      1160 * TO MAKE THE TEST. DEFAULT=1

```

(Continued on page 21)

(Continued from page 20)

0000	1170	*		CB46	BC	1820	CMP M	MEMORY STILL CLEAR?
0000	1180	*	ALL PARAMETERS TO BE IN HEX. SOLOS/CUTER	CB47	C4 A1 CB	1830	CNZ ERRA	NO, LIST ERROR
0000	1190	*	ROUTINES ARE USED TO CONVERT ADDRESSES.	CB4A	1B	1840	DCX D	SEC IF THRU WITH TEST A
0000	1200	*		CB43	23	1850	INX H	
0000	1210	*	THE FOLLOWING EQUATES BASED ON CUTER. SOLOS	CB4C	BA	1860	CMP D	
0000	1220	*	USERS SHOULD MAKE APPROPRIATE CHANGES.	CB4D	C2 45 CB	1870	JNZ TSTA1	
0000	1230	*		CB50	3C	1880	CMP E	
0000	1240	SCONV EQU 0C378H	CONV TO HEX, CK FOR ERRORS	CB51	C2 45 CB	1890	JNZ TSTA1	
0000	1250	PSCAN EQU 0C3A5H	SAME, BUT OPTIONAL	CB54		1900	*HERE MEANS TEST A COMPLETE	
0000	1260	RETRN EQU 0C344H	REENTRY POINT	CB54		1910	*	
0000	1270	SOUT EQU 0C319H	STD OUTPUT	CB54		1920	*NOW DO TESTS B,C, AND D	
0000	1280	ADOUT EQU 0C3D9H	FROM 'DUMP' ROUTINE	CB54		1930	*TEST B CHECKS TO SEE IF THE LOCATION IS STILL C	
0000	1290	BOUT EQU 0C3F7H	ALSO FROM 'DUMP'	CB54		1940	*TEST C WALKS A BIT THRU THE MEM LOC	
0000	1300	CRLF EQU 0C342H	CR-LF ROUTINE	CB54		1950	*TEST D LOADS AND RECOVERS 'FF'	
0000	1310	CUTAB EQU 0C83CH	CUSTOM COMMAND TABLE	CB54		1960	*	
0000	1320	*		CB54		1970	*FIRST, RESET BEGIN AND LENGTH	
0000	1330	PSW EQU 6	DONE ON OLD-STYLE SWP#1	CB54	2A DC CB	1980	LHLD LENGT	
0000	1340	*		CB57	EB	1990	XCHG	
0000	1350	*WHEN EXECUTED AT C800, THE ROUTINE		CB58	2A DA CB	2000	LHLD BEGIN	
0000	1360	*CREATES AN ENTRY IN THE SOLOS CUSTOM		CB58		2010	*	
0000	1370	*COMMAND TABLE FOR ITSELF, OVERWRITING		CB58	AF	2020	TESTB XRA A	TEST B STARTS HERE
0000	1380	*THE PREVIOUS FIRST ENTRY, IF ANY.		CB5C	3E	2030	CMP M	STILL CLEAR?
0000	1390	*		CB5D	C4 A6 CB	2040	CNZ ERRA	NO, LIST ERROR
0000	1400	DRG 0C800H	SOLOS/CUTER 1K RAM	CB60		2050	*	
C800	1410	*		CB60	3E 01	2060	MVI A,1	TEST C STARTS HERE
C800 21 4D 54	1420	LXI H,'TM'	COMMAND NAME (REVERSED)	CB62	77	2070	TSTC1 MOV M,A	MOVE TO MEMORY
C803 22 3C CB	1430	SHLD CUTAB		CB63	3E	2080	CMP M	LOAD OK?
C306 21 0D CB	1440	LXI H,START	EXECUTION ADDRESS	CB64	C4 AB CB	2090	CNZ ERRA	NO, LIST ERROR
C809 22 3E CB	1450	SHLD CUTAB+2		CB67	DA 6E CB	2100	JC TESTD	IF CARRY SET BY ERRC
C80C C9	1460	RET	THRU WITH SETUP	CB6A	17	2110	RAL	ROTATE TEST BIT
C80D	1470	*		CB6B	D2 62 CB	2120	JNC TSTC1	CHECKED 8 BITS YET?
C80D	1480	*MEM TEST ROUTINE STARTS HERE		CB6E		2130	*	
C80D	1490	START EQU \$		CB6E	3E FF	2140	TESTD EQU \$	
C80D CD 78 C3	1500	CALL SCONV	GET START ADDRESS OF TEST	CB70	77	2150	MVI A,OFFH	TEST D STARTS HERE
CB10 22 DA CB	1510	SHLD BEGIN	STORE FOR LATER USE	CB71	3E	2160	MOV M,A	MOVE 'FF' TO MEMORY
CB13 CD 78 C3	1520	CALL SCONV	GET # OF BYTES TO TEST (0-OFFH)	CB72	C4 31 CB	2170	CMP M	LOAD OK?
CB16 22 DC CB	1530	SHLD LENGT	STORE	CB75		2180	CNZ ERRA	NO, LIST ERROR
CB19 21 00 00	1540	LXI H,0	GET 16-BIT 0	CB75		2190	*THRU WITH TESTS ON THIS BYTE	
CB1C 22 DE CB	1550	SHLD ERRA	CLEAR ERR CTR	CB75	1B	2200	*	
CB1F 23	1560	INX H	SET UP FOR PSCAN	CB75	23	2210	*NOW SEC IF THRU WITH ALL BYTES	
CB20 CD A5 C3	1570	CALL PSCAN	GET OPT PARAM OR KEEP 1	CB76	23	2220	DCX D	
CB23 7D	1580	MOV A,L	GET LOW ORDER BYTE	CB77	AF	2230	INX H	
CB24 32 E0 CB	1590	STA TIMES	STORE	CB78	3A	2240	XRA A	
CB27 CD 42 C3	1600	CALL CRLF		CB78	3A	2250	CMP D	
CB2A	1610	*		CB79	C2 5B CB	2260	JNZ TESTB	
CB2A	1620	*THIS IS REENTRY POINT FOR MULTIPLE TESTS		CB7C	3C	2270	CMP E	
CB2A 2A DC CB	1630	AGAIN LHLD LENGT		CB7D	C2 5B CB	2280	JNZ TESTB	
CB2D EB	1640	XCHG	D-E HAS # OF LOCATIONS TO TEST	CB80		2290	*HERE MEANS ALL TESTS THRU FOR ALL BYTES	
CB2E 2A DA CB	1650	LHLD BEGIN	H-L HAS STARTING ADDR	CB80		2300	*	
CB31	1660	*		CB80		2310	*PRINT '\$' TO SHOW THAT 1 ITERATION IS COMPLETE	
CB31 AF	1670	CLEAR XRA A	ZERO ALL MEM LOCS TO BE TESTED	CB80	CD 00 CB	2320	CALL GOOD1	
CB32 36 00	1680	MVI M,0		CB83		2330	*	
CB34 1B	1690	DCX D		CB83	3A E0 CB	2340	*NOW, SEC IF WE SHOULD DO IT MORE TIMES	
CB35 23	1700	INX H		CB86	3D	2350	LDA TIMES	GET COUNTER
CB36 BA	1710	CMP D	NOW SEC IF THROUGH	CB87	CA 90 CB	2360	DCR A	
CB37 C2 31 CB	1720	JNZ CLEAR		CB8A	32 E0 CB	2370	JZ FINSH	ALL THRU
CB3A BB	1730	CMP E		CB8D	C3 2A CB	2380	STA TIMES	
CB3B C2 31 CB	1740	JNZ CLEAR		CB90		2390	JMP AGAIN	NOT YET, DO AGAIN
CB3E	1750	* ALL THROUGH WITH CLEAR.		CB90	CD 42 CB	2400	*	
CB3E	1760	*		CB93	CD 42 CB	2410	FINSH CALL CRLF	FINISH UP BY PRINTING
CB3E	1770	*NOW DO TEST A: CHECK IF ALL CLEAR		CB96	2A DE CB	2420	CALL CRLF	TOTAL # OF ERRORS
CB3E 2A DC CB	1780	TESTA LHLD LENGT	SET LENGTH WORD AGAIN	CB97	00 45	2430	LHLD ERRA	IN HEX.
CB41 EB	1790	XCHG	TO D-E	CB98	CD 3D CB	2440	MVI B,'E'	
CB42 2A DA CB	1800	LHLD BEGIN	GET START ADDR AGAIN	CB9E	C3 04 CB	2450	CALL ERRC	
CB45 AF	1810	TSTA1 XRA A		CB9E	C3 04 CB	2460	JMP RETRN	
				CB9E	C3 04 CB	2470	*	

(Continued on page 22)

```

CBA1      2480 *FOLLOWING ARE THE ERROR ROUTINES
CBA1      2490 *THEY PRINT THE LETTER CODE FOR THE TEST FAILED,
CBA1      2500 *FOLLOWED BY THE HEX ADDRESS OF THE FAILED BYTE.
CBA1      2510 *
CBA1      2520 *FORMATTED TO NICELY FIT THE SOL/VOM DISPLAY
CBA1      2530 *
CBA1      2540 *
CBA1 06 41 2550 ERRA MVI B,'A'
CBA3 C3 B3 CB 2560 JMP ERR1
CBA6 06 42 2570 ERRA MVI B,'B'
CBA8 C3 B3 CB 2580 JMP ERR1
CBA8 06 43 2590 ERRC MVI B,'C'
CBAD 37 2600 STC          THRU W/THIS BYTE
CBAE C3 B3 CB 2610 JMP ERR1
CBB1 06 44 2620 ERRD MVI B,'D'
CBB3 F5 2630 ERR1 PUSH PSW
CBB4 E5 2640 PUSH H
CBB5 2A DE CB 2650 LHLD ERRS
CBB8 23 2660 INX H
CBB9 22 DE CB 2670 SHLD ERRS
CBBE E1 2680 POP H
CBBD CD 19 C0 2690 ERR2 CALL SOUT
CBC0 06 3A 2700 MVI B,':'
CBC2 CD 19 C0 2710 CALL SOUT
CBC5 CD 09 C3 2720 CALL ADOUT
CBC8 CD F7 C3 2730 CALL BOUT   OUTPUT 1 MORE SPACE
CBCJ F1 2740 POP PSW
CBCO C9 2750 RET
CBCD      2760 *THIS PRINTS THE 'OK' CHARACTER
CBCD 06 24 2770 GOOD1 MVI B,'$'
CBCF CD 19 C0 2780 CALL SOUT
CBD2 3A DE CB 2790 LDA ERRS      ANY ERRORS?
CBD5 B7 2800 ORA A      SET FLAGS
CBD6 C8 2810 RZ          NO,SO SKIP CRLF
CBD7 C3 42 C3 2820 JMP CRLF      AND RET FROM THERE
CBDA      2830 *7 BYTES OF DATA SPACE FOLLOW
CBDA      2840 BEGIN DS 2
CBDC      2850 LENGT DS 2
CBDE      2860 ERRS DS 2
CBEO      2870 TIMES DS 1
^

```

BREAK

^TABL
SYMBOL TABLE

SCONV C378	PSCAN C3A5	RETRN C0J4	SOUT C019
ADOUT C309	BOUT C3F7	CRLF C342	CUTAB CB3C
PSW 0006	START CB0D	AGAIN CB2A	CLEAR CB31
TESTA CB3E	TSTAL CB45	TESTB CB5B	TSTC1 CB62
TESTD CB6E	FINSH CB90	ERRA CBA1	ERRB CBA6
ERRC CBAB	ERRD CBB1	ERR1 CB33	ERR2 CBBD
GOOD1 CBCD	BEGIN CBDA	LENGT CBDC	ERRS CBDE
TIMES CBEO			

KEREN YALDENU Inc.



OUR CHILD'S FUND

(Head Office: "Tikvatenu" Youth Center", 9 Montefiore St., Ramatana, Jerusalem - Tel: 521-25, 224699 • Mrs. M. Fraenkel, 4 Hamatubi St., Tel: 222784)

DEAR SIR

WE ARE A YOUTH CENTER DEALING WITH SOCIAL DISADVANTAGED CHILDREN. OUR MEDIA IS TEACHING THROUGH FUN AND CREATIVITY WE HAVE VARIOUS DEPARTMENTS LIKE ELECTRONICS, PHYSICS, MUSIC HANDCRAFTS AND ENGLISH TEACHING. WE STARTED A COMPUTER DEPT WHERE CHILDREN COULD LEARN ABOUT THE COMPUTER, HOW TO WRITE BASIC PROGRAMS AND FOR THE ADVANCED ONES EVEN IN ASSEMBLY LANGUAGE. THE CHILDREN ARE 9-13 YEARS OLD. OUR EQUIPMENT CONSISTS OF 4 SOL-20 AND 3 MICROPOLIS FLOPPY DISKS. WE HAVE ALSO A SPEECH ANALYSER AND SYNTHESIZER (COMPUTALKER) AND A MUSIC BOX.

WE ARE RUNNING P.T. BASIC 5 AND NOW 6.5K BYTE SHOP. WE ALSO USING ALS-8 FOR ASSEMBLY AND TEXT PROCESSING.

WE HAVING TROUBLE WITH BASIC 5 IN THE ESCAPE SEQUENCE FOR DISPLAY MODULE AND IN SETTING BREAKPOINTS IN ALS SIMULATOR GETTING THE IMPRESSION THERE IS A BUG HERE. ANOTHER DIFFICULTY IS THAT THE DISKETTE DRIVER ROM SITS AT F400 AND THE DRIVERS OF ALS ALSO. WE ARE NOT ABLE TO SAVE THE EDITED PRO ON THE DISKETTE. DO YOU HAVE THE LISTING OF ALS OR MAY BE SOME IDEA HOW TO SOLVE IT.

OUR SUBJECTS OF INTEREST ARE EVERYTHING THAT MAY ENTERTAIN OUR STUDENTS AND SOME APPLICATIONS LIKE A MAILING LIST, LETTER GENERATOR. WE HAVE OTHER CLUBS IN DIFFERENT CITIES IN ISRAEL EVEN IN BORDER VILLAGES AND WE ARE INTERESTED IN A PRIMITIVE NETWORK INSTALLATION.

WE HOPE THAT THROUGH THE SOLUS CLUB WE COULD FIND SOLUTION FOR OUR PROBLEMS AND ALSO FIND OTHER CLUBS WITH SIMILAR INTERESTS.

PLEASE FIND ENCLOSED A ONE YEAR SUBSCRIPTION. WAITING FOR A QUICK RESPONSE, I REMAIN

KALMAN BLONDER
[Signature]
COMPUTER CENTER COORDINATOR

P.S THIS IS LETTER WAS EDITED AND PRINTED WITH ALS-8. THERE ARE SOME TROUBLES WITH HYPHENATION AND JUSTIFICATION.



SAM76

the first LANGUAGE manual

IN THE LAND OF SAM

The SAM76 Language

The SAM76 language was designed by people for people - not by programmers for programmers. It follows a well defined syntax which is easy to learn and to read. The notation avoids the use of pseudo "English" words which are a frequent source of confusion and ambiguity in many of the other computer languages.

The SAM76 language can be used in as large a variety of tasks as one is able to imagine - this on personal computers without requiring computer specialists or programmers to intercede.

There are more than 150 functions - or instructions - available making the SAM76 language the most powerful available today, and it fits in approximately eight thousand bytes of memory; this can be ran or rom as the user desires.

The SAM76 language can be viewed as a real language which follows the user's stream of consciousness in much the same manner as spoken language. This permits the language in its written form as used by the computer and the user to serve as documentation.

The SAM76 language provides the user with the capability of requiring the computer to perform complex operations in many areas; a few of these are: Control, Text manipulation and editing, Simulation, Arithmetic with any desired precision.

The SAM76 language is interactive and reactive. As one task is accomplished the user continues and in effect the SAM76 language processor carries on a conversation, reacting to expressed desires.

The SAM76 language provides a uniquely flexible means to control facilities or to derive data from sources other than the user's keyboard.

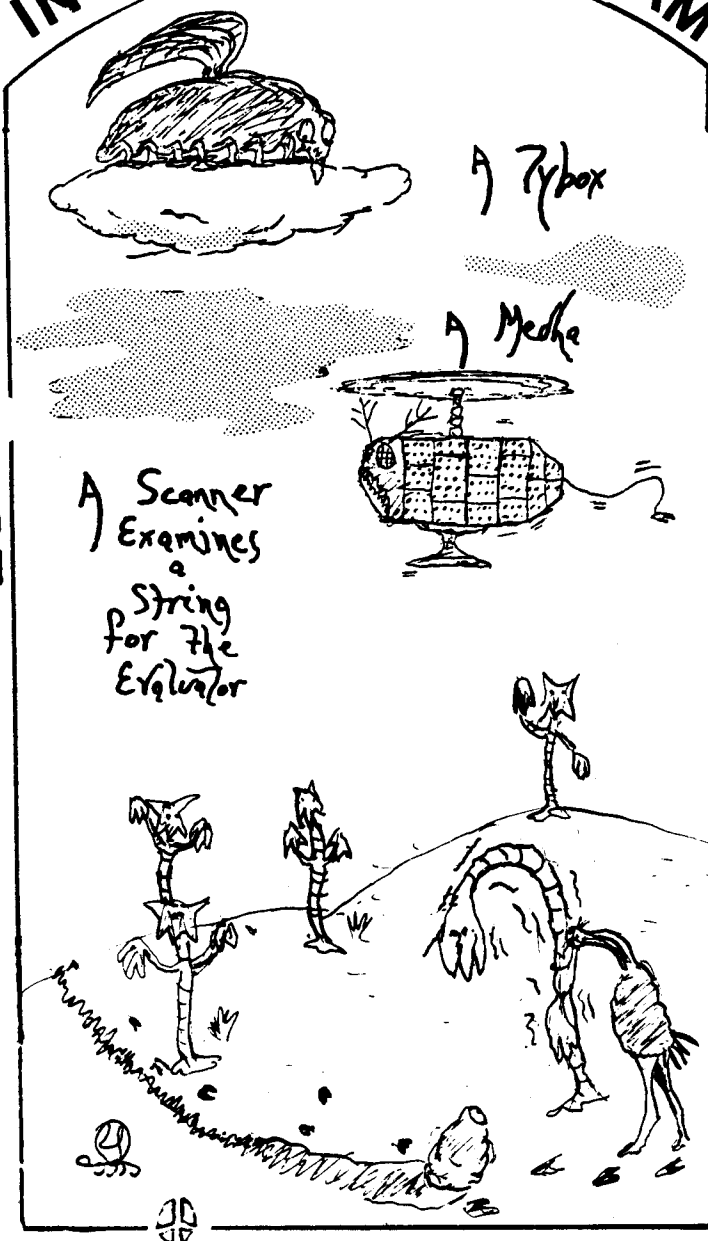
The SAM76 language is a "string processor". This means that the units of information are not confined to any fixed length, but may be made up of any number of characters, or even no characters, as determined by the user. Entire strings may be manipulated by single commands.

The SAM76 language is interpretive. This means that when a string is evaluated and an expression found to contain an instruction or command, then the specified action is immediately performed and the resulting value, if any, replaces that expression in the string.

The SAM76 language facilitates the use of pre-defined procedures. This means that the user's procedures or scripts may be stored for potential use and later called by name and immediately acted upon, with variables supplied to specified arguments as part of the process.

The SAM76 language makes no distinction, except in the user's own use of information, between data and procedures. Procedures tell the processor what to do; data is the information acted upon by the procedures. Procedures may be modified when other procedures treat them as data.

The SAM76 language is most powerful in providing man-machine interaction permitting the user to modify his work and to intervene when desired. The language provides facilities to define and save scripts for subsequent use; this in effect can behave or operate as if they themselves were inherent functions of the language.



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Also see SOLUS SOFTWARE DIRECTORY

designed for you and your personal computer

ON EXPANDING SOL TO 26 SLOTS

SMITH-KETTLEWELL INSTITUTE OF VISUAL SCIENCES
and
DEPARTMENT OF VISUAL SCIENCES
UNIVERSITY OF THE PACIFIC

2232 Webster Street
San Francisco, California 94115
(415) 567-0667 & 563-2323

25 September 1978

Dear Stan,

SOL has been too long backplane slot-bound. I have succeeded with a simple solution comprising a direct extension of the mother board and a separate power supply. I have used a TEI mainframe for the purpose but most any other box potentially capable of supporting a front panel should work.

First the front S-100 connector (the one a front panel would be plugged into) is removed and resoldered in the same location but on the bottom of the piggyback mother board, facing downward.

Next a half-inch-wide slot is cut in the underside of the add-on cabinet directly beneath the upside-down connector to completely expose it. The mother board is then reinstalled in the cabinet with the new S-100 connector available from the bottom.

Next cut off a piece of extender board about one inch long and trim its width such that it will plug into S-100 connectors on both ends. This short extender plugs directly into the SOL vertical S-100 connector on the bottom and into the resoldered TEI S-100 connector on top, connecting the two mother boards. The length of this short umbilical connector should be trimmed such that the two S-100 connectors mate flush with no extra space between them when the TEI chassis is carefully lowered onto SOL, in piggyback fashion. Before applying power, the +8 volt and + and -16 volt traces should be cut or removed from the short umbilical extender board. All other traces remain intact.

The new cabinet and mother board sit on top of SOL with the SOL rear cover removed. The TEI box is neatly centered on the SOL cabinet. The front edge of the TEI cabinet sits about an inch behind SOL's vertical faceplate. The back of the new cabinet overhangs the back of SOL by 2 to 8 inches, depending on the depth of the new cabinet. A 12 slot cabinet would overhang about 2 inches. My 22 slot TEI overhangs about 8 inches, but remains balanced since the PS is forward. A block in the rear holds it secure. (Legs could be fashioned if desired.) I place my CRT monitor on top of the new 7-inch-high cabinet.

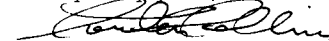
No termination is required or desired. All boards tried so far work well without termination. A Godbout active terminator caused troubles. To date the system has successfully supported the following boards:

Solid State Music 4 and 8K Memory
Seals 8K Memory
Seattle Computer Co. 16K (static) Memory
Helios controller and formatter
3 P + S
D + 7A I/O
Mullen Optoisolator (8 bit parallel I/O)
Computalker

Heuristics Speechlab
PT Music system
Mt. Hardware Controller (and AC Remotes)
Mt. Hardware Clock
Computime Clock and Calculator
Matrox 256 x 256 Graphics

Some snapshots of my system are included to help visualize the setup. It is a straightforward and a comparatively inexpensive method of providing SOL with a total of 26 slots.

Very truly yours,



Carter C. Collins, Ph.D.

PROGRAMMING NOTES

Bob Heerdink (Evansville, Ind.) wrote that he has trouble inputting multiple string variables in Extended Cassette BASIC (ECBASIC). For example,

```
10 INPUT A$,B,C
20 PRINT A$,B,C
```

produces this result:

```
(computer prompts for input) ?BANK,20.50,090178 (cr)
(computer prompts for more) ??(cr)
(computer prompts for more) ??(cr)
(computer prints result) BANK,20.50,090178 0 0
He observes that it looks like the comma which normally is used
to separate data items in a single input, gets put into the
string "A$".
```

The answer to this dilemma is that although the comma is normally the delimiter for data items and the carriage return (cr) ends the input line, in the case of string variable input, only the carriage return marks the end of the string. If you want to let the operator enter the string data delimited by commas as shown in the example, you should input the whole line as a single string, search for the commas, break the input into substrings, and convert the numeric parts with the "VAL(s)" function. This is actually a valuable feature of BASIC, so that text data with commas (such a name written "DOE, JOHN") can be input without regard for the number of commas in it. (Otherwise, a name like "DOE, JOHN J., Jr." would get messed up if you only expected one comma in the name.) Unfortunately, it is not explained in the Extended BASIC manuals, neither the cassette nor the disk version, to my knowledge.

Thanks for the question, Bob. If any readers have other problems they can't resolve, please write to us. We'll do our best to figure it out.

Here's another one. I personally discovered that my Extended Disk BASIC seemed to give an FD error when executing a valid disk I/O statement. It looked like a programming bug in EDBASIC. When I called PTC about it, the first question I was asked was "Did you ZIP 0 before initializing BASIC?". I thought back and remembered, I did zero memory (ZIP 0) all but the time I initialized the "bad" BASIC. I went back and followed directions, and ya' know what? It worked right. If your disk BASIC does funny things, try re-initializing it with ZIP 0 first. When all else fails, follow directions.

ADVERTISEMENTS

FOR SALE: SOL-20's, assembled, tested, dealer demos, as new condition. We'll warranty same as PTC. We have 4. Prices: No memory \$1600; with 16K RAM (8KRA or Seals 8KSC assembled) \$1950. Add \$7.50 UPS shipping (in 2 boxes). Allow time for non-certified checks to clear. We'll take M.C. or Visa, but add 2 1/2 %. Phone (800) 457-4440 to verify availability. Indiana residents add 4% sales tax, phone (800) 882-4794 inside Indiana. The Data Domain, Inc., 221 W. Dodds St., Bloomington, Indiana 47401.

SOFTWARE WANTED: I am an active radio amateur and I am looking for software for amateur radio use, such as radioteletype. I would appreciate any help in this area. Ronald T. Wenstrom, P.O.Box 94, Cold Bay, AK 99571.

REPAIR SERVICES: S-100 troubleshooting and software consulting. Very experienced with North Star products. Terry Niksch of The Wizard's Workshop, Emeryville, California, (415) 652-2252.

NEW PRODUCT ANNOUNCEMENT

SOL-20 Keyboard Modification Kit

Barry Watzman is pleased to announce the availability of the model CKB-1 keyboard modification kit for the Processor Technology SOL-20 series micro-computer. This kit modifies the 8-bit output from the numeric pad on the SOL-20 to produce an output with the high order bit (80H) true, allowing keys on the numeric pad to be distinguished from all other keys on the keyboard. Included with the kit is an assortment of over two dozen double shot molded custom keytops with text-editing/word-processing legends which match exactly in color and style the standard keytops supplied with the SOL-20. Thus by installing this kit and making the appropriate software modifications, a user of ALS-8, The Electric Pencil or similar programs may now have explicit, clearly labeled keys for such functions as insert and delete line, insert and delete character, roll up, roll down, etc., rather than having to remember one or two dozen obscure control code sequences.

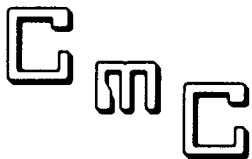
The model CKB-1 consists of the set of custom keytops, a special custom programmed ROM and instructions, and is installed simply by replacing U18 on the keyboard with the custom ROM supplied, replacing the numeric keytops with the desired function keytops, and making the necessary changes in the user's software to recognize the new control codes (suggested patches for ALS-8 and the CP/M version of The Electric Pencil II are included). And, since the only changes are to the 80H bit, the keyboard may be reverted to it's numeric mode either by re-installing the original IC ROM, or more simply, by doing an ANI 7FH in software.

The model CKB-1 sells for \$24.95 and is available from:

Barry A. Watzman
2330 Millennium Ln.
Reston, Va. 22091

Va. Residents should include 4% sales tax and order from:

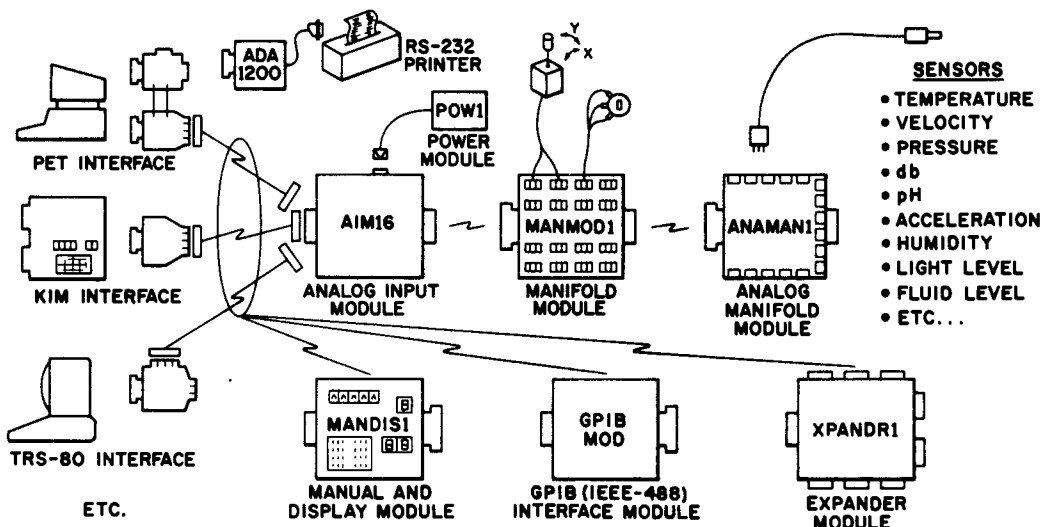
The Computer Systems Store
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AIM161 - Analog Input Module 16 8-bit analog inputs - 100 microsecond conversion time - 3 state output - requires one 8-bit computer output port for control and one 8-bit computer input port for data	\$159.00
AIM162 - Analog Input Module As above plus: greater accuracy - gold plated contacts - pilot light - switch selectable start, enable and ready polarities.	\$229.00
POW1 - Power Module Supplies power for one AIM16 module.	\$14.95
ICON - Input Connector 20 pin card edge connector - solder eyelets	\$9.95
OCON - Output Connector For connecting the AIM16 to a computer - 18 pin card edge connector - solder eyelets	\$9.95
AIM161 Starter Set Includes one AIM161, one POW1, one ICON and one OCON.	\$189.00
AIM162 Starter Set Includes one AIM162, one POW1, one ICON and one OCON.	\$259.00
MANMOD1 - Manifold Module Use in place of ICON. 16 3-screw terminal barrier strips for connecting joysticks, potentiometers, voltage sources, etc. Eliminates the need for soldering. Plugs into the AIM16.	TBA
ANAMAN1 - Analog Manifold Module Use in place of ICON. Connects DAM SYSTEMS SENSORS to the AIM16 without soldering - sensor cables just plug in. Plugs into the AIM16 or the MANMOD1.	TBA
SENSORS Sensors for temperature, pressure, flow, humidity, level, pH, motion, etc.	TBA
COMPUTER INTERFACES For the PET, KIM, TRS-80, etc. Use in place of OCON. Eliminates the need for soldering or special construction.	TBA
MANDIS1 - Manual and Display Module Connects between the AIM16 and the computer interface. Allows manual or computer control of the AIM16. Displays channel number and data.	TBA
GPIB MOD - GPIB (IEEE-488) Interface Module Allows the DAM SYSTEMS MODULES to be used with the GPIB bus instead of a computer's other I/O ports.	TBA
XPANDR1 - Expander Module Allows up to 128 8-bit analog inputs (8 AIM16 Modules) to be connected to one system.	TBA

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SAM76 language ²⁷

238 - @f,s0	wh@ are Functions	: 149 - hp,t,d	How many Partitions	: 199 - sem,dev	Set "Echoplex" Mode active
239 - @n	wh@ is processor ser. Number	: 114 - ht,t	Hide Text	: \sem,dev\	"Echoplex" Mode inactive
237 - @t	wh@ is processor Title	: \ht	Hide all Texts	: 222 - sf,f,t1,t2,...,t	Store File
159 - ab,s1,s2,vt,vf	Alphabetic Branch	: 115 - ic	Input Character	: 157 - sfd,fun,dev	Specify Function Device
128 - ad,n1,n2,n3,...,n	Add	: 116 - id,d	Input "D" characters	: 190 - sh,d,x	Shift the bits
160 - ai,s0,s1,s2,...,s	Alphabetic Insertion	: 153 - idt,d	Input "D" Texts	: 253 - srn,n	Seed Random Number
187 - and,x1,x2	And the bits	: 136 - ig,d1,d2,vt,vf	If Greater	: 258 - sti,t1,t2,t3	Set Time
161 - as,s0,s1,s2,...,s	Alphabetic Sort	: 135 - ii,s1,s2,vt,vf	If Identical	: 129 - s1,n1,n2,...,n	Subtract
220 - bf,f,vz	Bring File	: 117 - im,s1,s2,...,s	Input to Match	: 231 - sw,s1,s2,s3,...,s	Switches
113 - ca,s	Change Activator (current)	: 102 - is,dev	Input String	: 232 - sy,s1,s2,...,s	System functions
\ca,s\	Change Activator (initial)	: 152 - it	Input Text	: 127 - tb,t,vt,vf	Text Branch
195 - cfc,d1,s	Change Fill Character schema	: 213 - iw,n	Input Wait	: 257 - ti,s1,s2	Time
\cfc,d1,s\	Change Fill Char. (initial)	: - lef,dev	Load External Function	: 125 - tm,d	Trace Mode activated
193 - cin,t1,d1,...,t,d	Change Id Number	: 216 - lf,s0,d1,...,d	List Files	: \tm\	Trace Mode deactivated
148 - cid,t	Characters Left of Divider	: - lr, ...	List Relationship	: 124 - tma	Trace Mode All activated
191 - cll,d	Change Line Length (active)	: 105 - lt,s0,d1,d2,...,d	List Texts	: \tma\	Trace Mode All deactivated
\cll,d\	Change Line Length (initial)	: 214 - lw,s0,s1,s2,...,s	List Where	: 168 - tr,t,s	Trim
133 - cnb,d	Change Number Base (active)	: 110 - mc,d	Multi-partition Character	: 218 - uf,f,t1,t2,...,t	Update File
\cnb,d\	Change Number Base (initial)	: 146 - md,t,d	Move Divider to pos. "d"	: 169 - ut,cc	User Trap active
266 - cpc,t1,d1,...,t,d	Change Protection Class	: \md,t,d\	Move Divider "d" increments	: \ut\	User Trap inactive
147 - crr,d	Characters Right of Divider	: 109 - mt,t,s1,s2,...,s	Multi-part Text all matches	: 118 - vt,t1,t2,...,t	View Texts
203 - cro,s1	Change Rub Out char. schema	: \mt,t,s1,s2,...,s\	Multi-part Text next match	: 181 - wc,s1,s	Write Characters
\cro,s1\	Change Rub Out (initial)	: 130 - mu,n1,n2,vz	Multiply	: 175 - wi,xnl,ynl	Write Initialize
132 - ct,t1,t2,t3,...,t	Combine Texts (superseding)	: 111 - ni,vt,vf	Neutral Implied	: 179 - wl	Width Left
\ct,t1,t2,t3,...,t\	Combine Texts (save current)	: 188 - not,x	Not (complement) the bits	: 178 - wr	Width Right
250 - cwc,s1	Change Warning Character	: 209 - nu,s1,s2,...,s	Null	: 180 - ws,xnl,ynl,...,xn,yn	Write Straight Lines
\cwc, ... \	Change Warn. Char. (initial)	: 246 - oj,s,s1,d,s2	Output Justified lines	: 176 - wx	Write "X" displacement
261 - cws,d	Change Work Space	: 248 - op,s,s1,d,s2	Output Padded lines	: 177 - wy	Write "Y" displacement
\cws,x\	Character to "X"	: 186 - or,x1,x2	Or the bits	: 170 - xc,x1,x2,...,x	"X" to Character
171 - cx,s0,s	Change "X" Base (active)	: 101 - os,s	Output String	: 271 - xcf,s,x	eXperimental Change Function
200 - cxb,d	Change "X" Base (initial)	: 154 - ot,t1,t2,...,t	Output Texts	: 172 - xd,x	"X" to Decimal
\cxb,d\	Date	: 108 - pc,d	Partition Character	: 255 - xi,port	eXperimental Input
259 - da,s0	Divide	: 174 - pl,s1,s2,...,s	Plot	: 123 - xj,x	eXperimental Jump
131 - di,n1,n2,vz	Define Quote	: 162 - ps,d,s1,s2	Pad String	: 256 - xo,x,port	eXperimental Output
208 - dg,s	Define Relationship	: 107 - pt,t,s1,s2,...,s	Partition Text all matches	: 270 - xqf,s	eXperimental Query Function
\dr,t,a,o,v	Duplicate String	: \pt,t,s1,s2,...,s\	Partition Text next match	: 119 - xr,x	eXamine Register
164 - ds,d,s	Define Text (superseding)	: 196 - qfc,s0	Query Fill Character schema	: 121 - xrp,x	eXamine Register Pair
103 - dt,t,s,d1,d2	Define Text (save current)	: 194 - qin,s0,t1,t2,...,t	Query Id Number	: 120 - xw,x1,x2	eXperimental Write in reg.
\dt,t,s,d1,d2\	Decimal to "X"	: 197 - qld,t	Query Left of Divider	: 122 - xwp,x1,x2	eXperimental Write reg. Pair
173 - dx,d,x	Erase All excepting	: 192 - qll	Query Line Length	: 126 - yt,t,s,vt,vf	Ys There
206 - ea,t1,t2,...,t	Extract "D" characters	: 134 - qnb	Query Number Base	: 182 - zd,r,v-,v0,v+	"Z" reg. Decrement and branch
207 - ed,t,d1,d2,vz	Erase Files	: 202 - qof	Query Over Flow conditions	: 183 - zi,r,v-,v0,v+	"Z" reg. Increment and branch
224 - ef,f1,f2,...,f	Erase Partitions	: 167 - qp,t	Query Partition	: 184 - zg,r	"Z" reg. Query
151 - ep,t,pl,p2,...,pl	Express Relationship	: 267 - qpc,s0,t1,t2,...,t	Query Protection Class	: 185 - zs,r,n	"Z" reg. Set
- er, ...	Erase Text	: 198 - qrd,t	Query Right of Divider		
104 - et,t1,t2,...,t	Erase all occurrences of Text	: 204 - qro	Query Rub Out char. schema		
\et,t1,t2,...,t\	Erase Trailing Blanks	: 205 - qta	Query Text Area used		
249 - etb,s	Exit	: 251 - qwc,a2,a1,...,a	Query Warning Characters		
112 - ex,f	File Branch	: 262 - qws	Query Work Space		
226 - fb,f,vt,vf	Fetch Character	: \qws\	Query "X" Base		
137 - fc,t,vz	Fetch "D" Characters	: 201 - qxb	Return Argument		
138 - fdc,t,d,vz	Fetch "D" Elements	: 215 - ra,d,s1,s2,s3,...,s	Return Character Picture		
139 - fde,t,d,vz	Fetch "D" Matches	: 263 - rcp,d1,d2,s	Restart Initialized		
140 - fdm,t,d,s,vz	Fetch Element	: 166 - ri	Return Justified lines		
141 - fe,t,vz	Fetch Field	: 245 - rj,s,s1,d,s2	Random Number		
142 - ff,t,d,vz	Fetch Left match	: 252 - rn,n	Rotate the bits		
143 - fl,t,s,vz	Fetch Partition	: 189 - rot,d,x	Return Padded lines		
145 - fp,t,x1,...,x	Fetch Right match	: 247 - rp,s,s1,d,s2	Return to Restart		
144 - fr,t,s,vz	Fetch Text	: 165 - rr,s1	Reverse String		
106 - ft,t,s1,s2,...,s	Fetch To Break character	: 163 - rs,s	Select All File function dev.:		
210 - ftb,t,s,vz	Fetch To Span character	: 228 - saf,d,v	"Auto Return" on line feed :		
211 - fts,t,s,vz	How many Characters	: 158 - sar	no Auto Return on line feed :		
212 - hc,s	How many Matches	: \sar\	Set Date		
150 - hm,t,s		: 260 - sda,da,mo,yr			

Expression formats, legend, syntax and conventions:

function,arguments,...,	Active Expression
\function,arguments,...,\	Neutral Expression
x,x1,...	"x" base numbers - f file name
d,d1,...	Decimal numbers - t text name
n,n1,...	"n" base numbers - vz default value
s0	prefixing string - v-,v+,v0 conditional value
s,s1,...	character strings - vt,vf true/false value
!..../(....) <....> @char.	Protection syntax
- S: %fn,arguments/ - M: %fn,arguments;	Active syntax
- S: &fn,arguments/ - M: %fn,arguments;	Neutral syntax
%vt,t/= partition [d], multi-partition [#d], divider [^]	
<sce-xxx>	special condition encountered
<nax-xxx>	xxx not available

SAM 76 EXAMPLES

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%os,%is// is the Restart Expression which is originally loaded. It means: "output that string which results from the evaluation or execution of the string to be input". Thus:

1. Input a String
2. Evaluate said string
3. Output the result of the evaluation

In the examples that follow, the "os" of the Restart Expression will not be shown, but its presence is implied. For clarity in these examples output will be shown between a pair of curly braces thus: { ... }.

```
ABCDEFHG={ABCDEFHG}
```

The "os" of the Restart Expression causes to be output that string which was entered through execution of the "is" (Input String) of the Restart Expression. The "=" equal sign is the Activator, signalling the end of the input string.

```
%os,APPLE/={APPLE}
```

The function "os" (output string) in the expression causes the output of the second argument of the expression; the comma is sensed as a delimiter between arguments and only the second argument will be output by the "os" function.

```
%os,APPLE<, >ORANGE/={APPLE,ORANGE}
%os,<APPLE,ORANGE>/={APPLE,ORANGE}
%os,APPLE@,ORANGE/={APPLE,ORANGE}
```

Here the comma is protected, hence it does not act as a delimiter, and is entered as part of the input string. As part of the string it is output by the "os" function. Note that the protective symbol pair (in this case <...>) may be anywhere as long as the comma is enclosed. Other protective symbol pairs that may be used are (...) and !.../; in addition any single character immediately preceded by a "@" sign is also protected as shown on the third line example.

```
%dt,A,APPLE@,ORANGES/=
```

Define a Text named A with contents APPLES,ORANGES and store it in a section of memory named the "Text Area".

```
%os,%ft,A/={APPLES}
%os,%A/={APPLES}
%os,%ft,A/={APPLES,ORANGES}
%os,%A/={APPLES}
```

Fetch from the Text Area "A" and output its contents. If the name of the text is not the same as that of any of the functions of the language, the fetch may be made as shown on the second line of the example; this is said to be an "implied fetch". Should the text contain symbols which should normally have been protected, or if it is desired not to evaluate the text to be fetched, then the format of the third line should be used; this is said to be a "neutral explicit fetch". The fourth line shows a "neutral implied fetch"; this behaves in a manner that is identical to the first two lines of the example, but information is retained in the computer that it was a "neutral implied" fetch.

```
%A/={APPLES}
&ft,A/={APPLES,ORANGES}
```

Fetch the text named A, both actively and explicitly neutrally. Output is effected by the "os" function of the Restart Expression as indicated in the following sequence:
1. %os,%is// 2. %os,%A// 3. %os,APPLES,ORANGES/ 4. APPLES

```
%dt,A,THE DOG AND THE CAT AND THE HORSE/=
```

As a part of defining this text named A, the previously defined text also named A is erased from the Text Area, and the new text A, containing the new text string is created.

```
%dt,B,%A/%ct,C,A/=/
%os,%A/={THE DOG AND THE CAT AND THE HORSE}
%os,%B/={THE DOG AND THE CAT AND THE HORSE}
%os,%C/={THE DOG AND THE CAT AND THE HORSE}
```

Define a text named B as the value resulting from fetching A and create C by copying A using the "ct" copy text function.

```
%pt,B,THE,DOG,AND,CAT,HORSE/=
```

Partition the text named B on the character patterns, "THE", "DOG", "AND", "CAT", "HORSE", creating partitions at those locations in Text B where each pattern appears. The partitions where the first pattern occurred are given a value of [1], the partitions where the second pattern occurred are given value [2], etc.

```
%vt,B/={ [1] [2] [3] [1] [4] [3] [1] [5] }
```

"vt" (View Text) will show the numerical value and location of the partitions in a Text. Note that the unpartitioned patterns (the spaces between the words) remain intact.

```
%B,LE,CHIEN,ET,CHAT,CHEVAL/
={LE CHIEN ET LE CHAT ET LE CHEVAL}
```

The partitions with values 1, 2, 3 etc., are plugged by the second, third, fourth etc. arguments of the fetch of Text B, and the plugged string resulting is then output by the Restart Expression. A new line code was input before the Activator. This is why the output is on the second line.

```
%vt,B/={ [1] [2] [3] [1] [4] [3] [1] [5] }
```

Note that Text B still has the partitions.

```
%dt,B,%B,LE,CHIEN,ET,CHAT,CHEVAL/=/
%B/={LE CHIEN ET LE CHAT ET LE CHEVAL}
%A/={THE DOG AND THE CAT AND THE HORSE}
%lt,*/={*A*C*B}
%lt,
/={
A
C
B}
```

This will redefine B, plugging the partitions as indicated; note that any unplugged partitions at this point would be plugged with "null" strings. The text B, had been defined as the same as text A. Then it was partitioned on the English words in it and was then redefined with the corresponding French words replacing the English ones.

The names of the Texts in the Text Area are determined through use of the "lt" (List Texts) function. Each text name is PRECEDED by whatever delimiting character pattern the user specifies as the second argument of the expression. One example uses an asterisk, and the other example has a new line code as the second argument of the expression.

SAM 76 inc. Pennington, N.J. 08534

```
%dt,A,!%os,THIS IS A PROCEDURE///=
%A/={THIS IS A PROCEDURE}
&ft,A/={%os,THIS IS A PROCEDURE/}
```

A procedure is a text consisting of one or more expressions executed by fetching said text "actively". An explicit neutral fetch serves only to fetch it without its being executed. The protective pair !.../ serves to prevent execution during the process of definition. Partitions, if any may be plugged during the fetching process at the time of execution. Other examples of procedures follow.

```
%dt,SQUARE,!%mu,*,*///=
%pt,SQUARE,*/=
%vt,SQUARE/={%mu, [1], [1]/}
%$SQUARE,9/={81}
&$SQUARE,12/={144}
```

```
%dt,HOWDY,!%os,
WHAT IS YOUR NAME?- /%os,
WELL HELLO THERE %is///=
%HOWDY/=
{WHAT IS YOUR NAME?- }BILL=
{WELL HELLO THERE BILL}
```

As strings are evaluated from the inside out and from left to right, procedures can be nested within other procedures. In this case the Activator must be entered after the name (BILL in this case), to signify the end of the "is" function. This value "BILL", then replaces the %is/ in the procedure and is output by the second "os".

```
%dt,LOOP,!%os,
THIS PROCEDURE LOOPS/%LOOP///=
%LOOP/={
THIS PROCEDURE LOOPS
THIS PROCEDURE LOOPS
THIS PROCEDURE LOOPS
THIS PROCED
<sce-os>}
```

To make a procedure loop, it must fetch itself. If the looping procedure has partitions in it, they will be plugged during the fetching process. In such cases if no plugs are specified, null strings will be used. In this example the loop was broken from the keyboard by hitting the "rubout" or "del" key; the <sce-os> message means "special condition encountered" during the execution of "os".

```
%dt,F,!%ii,* ,1,1,`
!%mu,*,%F,%su,* ,1////////=
%pt,F,*/=
%F,1/={1}
%F,3/={6}
%F,5/={120}
```

A short recursive procedure may find the factorial of any number. This procedure tests the entered number, plugging the partitions, to see if it is a 1; if not, the factorial of the entered number is that number multiplied by the factorial of that number minus 1, which is computed by fetching F. Sometimes it is desired to organize the procedures in several lines, or use tabs to indent the lines; these formatting characters (used only for esthetic reasons) are not really part of the executable matter, and would clutter up the scanning process. Such clutter is avoided by preceding characters which have only an aesthetic meaning with the " " or "grave" accent mark.

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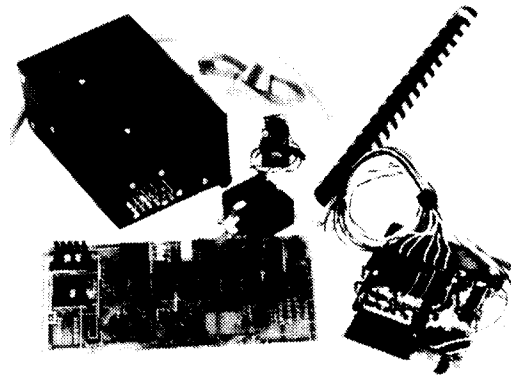


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PROGRAM NAME: TINY-C CATEGORY: Programming Language
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DESCRIPTION: TINY-C is an interpreter for a subset of the C programming language. Structured programming now possible in 16K in an interactive environment. Includes Program Preparation System (Editor) and augmented function library. Two byte integers, character strings, peek and poke, calls to assembly language routines. Read and write files. Custom interface uses facilities of operating system for character and file I/O.

MINIMUM HARDWARE REQUIRED: 16K RAM plus RAM/ROM for operating system.

SOFTWARE REQUIRED: Three versions: SOLOS/CUTER, HELIOS(PTDOS) and NORTHSTAR in two forms, standard and premium.

RESTRICTIONS: No floating point. Only one open file at a time in this version.

DOCUMENTATION: TINY-C Owners Manual (350+ pp). Separate manuals for each operating system (15+pp).

MEDIA: SOLOS/CUTER-cassette. HELIOS-diskette. NORTHSTAR-diskette.

DATE CURRENT VERSION WAS RELEASED: Sept. 1, 1978

WARRANTY: 30 da exchange. 1 yr notification. (Subject to change).

PRICE: Owners Manual \$40. Standard version: SOLOS \$30, HELIOS, NORTHSTAR

ORDER FROM: diskette \$35. add \$20 for Premium version.

METRON Computerware Inc. P.O.Box 865. N.Y.,N.Y. 10025
Also available from some dealers.

REMARKS: Postage and handling extra for orders outside of USA and for purchase orders not accompanied by payment. Prices subject to change. Standard version has load-and-go interpreter plus Program Preparation System. Premium version has applications programs, segmented PPS, pirenha fish game, Upper and Lower case mode. Source for TINY-c and custom interface on request- write for quote

PROGRAM NAME: HELP1 CATEGORY: Operating System

DESCRIPTION: HELP1 is an operating-software package consisting of five standalone assembly-language programs designed to run under HELIOS PTDOS. Included are: a device-driver file for the Tarbell Cassette Interface for tape/disk operations; CL0D and CSAV for tape/memory operations; and ASCII-hex memory enter and dump commands. All programs operate as direct console commands with parameters.

MINIMUM HARDWARE REQUIRED: less than 2K system RAM plus the usual 12K for PTDOS.

SOFTWARE REQUIRED: HELIOS PTDOS.

RESTRICTIONS: none.

DOCUMENTATION: 30-page user's manual with full description of operation and options. Source listings of patchable areas are provided.

MEDIA: HELIOS data-diskette.

DATE CURRENT VERSION WAS RELEASED: March, 1978

WARRANTY: 30 days exchange, repair/replace; 1 year notify for changes.

PRICE: \$22.95 postpaid; add tax to California orders.

ORDER FROM: LMC ENGINEERING
185 South Alice Way
Anaheim, CA 92806

REMARKS: This software is flexible and includes many command parameter options and recorder controls. All programs run unchanged on any HELIOS system but many patch provisions are included for user customization.

HELP1 is furnished on a formatted HELIOS data-diskette which may be copied or used for other purposes.

PROGRAM NAME: THE ELECTRIC PENCIL CATEGORY: WORD PROCESSING SYSTEM

DESCRIPTION: This is a character-oriented word processor that is extremely flexible and has had wide market acceptance for two years. It does global search and replace, pagination, right justifies, bidirectional scrolling; text has wraparound feature on the screen, left hand margin control, titles pages, underlines and much more. It is sophisticated yet simple to use. The system is very fast and all editing work is seen instantly on the video display. Print formats are very broad as the user decides on line, page and MINIMUM HARDWARE REQUIRED: character spacing.

SOFTWARE REQUIRED: SOL-20, Video monitor, Standard or Diablo Printer, Cassette Recorder or NorthStar Disk. Minimum 8K (cass.) or 12K memory.

SOFTWARE REQUIRED: SOLOS/CUTER or NorthStar DOS

RESTRICTIONS: Will only work with video interface and monitor.

DOCUMENTATION: A 35 page easy-to-read manual written with the turnkey user in mind.

MEDIA: CUTS CASSETTE or North Star Diskette

DATE CURRENT VERSION WAS RELEASED: FEB.1977

WARRANTY: Software support

PRICE: Cassette Prices; Stand.Ptr. \$100/Diablo \$150 NSDisk add \$25.00

ORDER FROM: MICHAEL SHRAYER SOFTWARE, INC.
1253 VISTA SUPRBA DRIVE
GLENDALE, CA 91205

REMARKS: All shipments are made from stock. Orders must be prepaid or COD. The Electric Pencil is also available at local computer dealers across the country and in Canada.

PROGRAM NAME: MODEM1 CATEGORY: Operating System

DESCRIPTION: MODEM1 is an assembly-language program designed to provide telephone-line interface to HELIOS PTDOS. This program, with the D. C. Hayes 80-103 S-100 buss modem, provides remote-terminal operation of the HELIOS system. Automatic answer, sign-on message, and total system operation from the remote terminal are provided. Local-console control is maintained for supervision and optional display of system usage. Total unattended HELIOS system operation is routine.

MINIMUM HARDWARE REQUIRED: less than 2K RAM plus usual 12K for PTDOS. The D. C. Hayes 80-103 S-100 buss modem board is required.

SOFTWARE REQUIRED: HELIOS PTDOS

RESTRICTIONS: 110 and 300 baud operation only.

DOCUMENTATION: 20-page user's manual with full description of operation and options. Source listings of patchable areas are provided.

MEDIA: HELIOS data-diskette.

DATE CURRENT VERSION WAS RELEASED: November, 1978

WARRANTY: 30 days exchange, repair/replace; 1 year notify for changes.

PRICE: \$34.95 postpaid; add tax to California orders.

ORDER FROM: LMC ENGINEERING
185 South Alice Way
Anaheim, CA 92806

REMARKS: Various PTDOS system-global parameters are changed. Optional nulls after linefeed may be added to support remote printers. A modification is described to allow remote control of the disk-drive spindle motor to reduce disk wear during idle periods. MODEM1 runs unchanged on any HELIOS system but many patch provisions are included for user customization.

MODEM1 is furnished on a formatted HELIOS data-diskette which may be copied or used for other purposes.

PROGRAM NAME: UN-Z80

CATEGORY: System development

DESCRIPTION: UN-Z80 disassembles Z-80 object code and produces assembly listing format output or source code for storage, edit & reassembly. Generates TDL mnemonics. Object to be disassembled may be segmented or contiguous anywhere in the available memory space. User input specifies format(byte, word or program) for each segment. Load bias is adjusted, and labels generated for all references. All I/O byte oriented.

MINIMUM HARDWARE REQUIRED: For list output- 8K (depend on module to be disassembled. For cassette or disk output, CUTER, NS DOS or CPM required.

SOFTWARE REQUIRED: Standalone, if generating list output. Appropriate I/O interfaces provided by user

RESTRICTIONS: Generates TDL mnemonics. Not necessarily a limitation, if good macro-assembler is available.

DOCUMENTATION: Provided both in paper and machine readable form.

MEDIA: CUTER 1200 baud cassette, North Star, or CPM(8" or mini) floppy diskettes.

DATE CURRENT VERSION WAS RELEASED: April 1978

WARRANTY: 30 day media warranty. Agreement enclosed.

PRICE: Nort Star(2A00H)-\$40, CPM versions(100H)-\$50, CUTER or NS reloc versions-\$55

ORDER FROM: alphaBIT Microsystems, Box 1107, 2000 Center St., Berkeley, CA 94704

Check or money order must be accompanied with order. Overseas orders must add \$7.00 per order for airmail and registration.(not including Canada). California residents must include sales tax.

REMARKS: UN-Z80 code itself is only 3K approx. including tables and patch area. Symbol table is generated in a workspace, and requires 7 bytes per symbol. This workspace defaults to the end of the program, but may be moved, and limited in size if the user wishes. Inquire from your local dealer if available from him yet.

PROGRAM NAME: DISAM

CATEGORY: PROGRAMMING AID

DESCRIPTION: 8080 Disassembler and dumper.

The disassembler operates on program in memory to display or append to a file in memory the equivalent source code.

Two passes can be controlled by operator to suppress unneeded labels. Program can be rearranged or selected sections can be combined. The dump command gives combined hex and ASCII dump.

Appears as 5 custom commands under SOLOS/CUTER.

MINIMUM HARDWARE REQUIRED: RAM DAAF-DF7C plus stack and SOLOS, CUTER or my command interpreter. Or get source files and reassemble.

SOFTWARE REQUIRED: SOLOS, CUTER or optional command interpreter.

Memory files work with ALS-8, Software 1, Micropolis MDOS. assemblers.

RESTRICTIONS: You must guide it around data tables if you want perfect results in disassembly. Doesn't build DB, DW etc.

DOCUMENTATION: Dr. Dobb's Journal ... #27 (Aug 78) carried article and assembly listings. Command list available on request.

MEDIA: CUTS cassette (300 or 1200 baud) or MOD II Micropolis(send ^{diskett} one).

DATE CURRENT VERSION WAS RELEASED: 3/23/78 assembly date.

WARRANTY: Refund if returned with statement no copy made. Consultation.

PRICE: \$4 assembled as stated, \$8 special origin, \$6 source 20K file).

ORDER FROM: \$8 source in 3 parts.

Richard Greenlaw
251 Colony Ct.
Gahanna, Ohio 43230

(not currently available
through dealers.)

REMARKS:

No credit cards. Checks ok. I provide a cheap cassette and first class US postage. Extensively tested. If you don't have the article ask for brief summary of instructions and commands. This is not a business - sometimes there are delays, but I haven't exceeded 30 days yet.

PROGRAM NAME: THE ELECTRIC PENCIL CATEGORY: WORD PROCESSING SYSTEM II

DESCRIPTION: The Electric Pencil II is a highly sophisticated word processor that adds 20 new features to the original Electric Pencil. This version accesses four disk drives, dynamic print formatting, talking screen, stops at the end of page, nine speeds of bidirectional scrolling, video page at a time scrolling, total left margin control, print value scoreboard, plus centering, underlining and boldface. There are even more great new features to THE ELECTRIC PENCIL II that make it one of the most popular application software packages on the market today.

MINIMUM HARDWARE REQUIRED: SOL Computer system, video monitor, Standard or Diablo Printer, 16K memory, and some CP/M Disk System.

SOFTWARE REQUIRED: CP/M Disk Operating System.

RESTRICTIONS: Must use a video interface board and monitor.

DOCUMENTATION: An excellent 38 page user's manual that is simple to read and written with the turnkey user in mind.

MEDIA: 8" softsectored diskette, NStar minidiskette, or Micropolis minidiskette

DATE CURRENT VERSION WAS RELEASED: March 1978

WARRANTY: Software support

PRICE: Standard Printer \$225.00 Diablo Hyterm Printer \$275.00

ORDER FROM: MICHAEL SHRAVER SOFTWARE, INC.

1253 VISTA SUPERBA DRIVE
GLENDALE, CA 91205

REMARKS: All orders are shipped from stock. Orders are prepaid or COD. Also available at local computer stores across the country. All Pencils can be upgraded. Here's how: send in the original media, \$15 upgrade charge plus the price difference between the old and new versions and include \$2 for shipping and handling. You will receive new media and new documentation.

PROGRAM NAME: THE ELECTRIC PENCIL CATEGORY: WORD PROCESSING SYSTEM II

DESCRIPTION: This is the HELIOS version of The Electric Pencil II and has all the great features as described above. In addition, this version is completely compatible with PTDOS.

MINIMUM HARDWARE REQUIRED: SOL Computer system, video monitor, Standard or Diablo Hyterm Printer, Helios Disk System, 24K memory minimum.

SOFTWARE REQUIRED: PT DOS

RESTRICTIONS: Must have video interface and monitor; the program will not run on a serial CRT such as a Soroq or Hazeltine.

DOCUMENTATION: A 40 page user's manual that is easy to read and simple to understand.

MEDIA: An 8" diskette for use on HELIOS SYSTEM

DATE CURRENT VERSION WAS RELEASED: JUNE 1978

WARRANTY: Software support

PRICE: Standard Printer \$250.00 Diablo Hyterm Printer \$300.00

ORDER FROM: MICHAEL SHRAVER SOFTWARE, INC.

1253 VISTA SUPERBA DRIVE
GLENDALE, CA 91205

REMARKS: All orders are shipped from stock. Orders are prepaid or COD. This program is also available from computer dealers across the country. Please note the upgrade policy as mentioned above; you may always upgrade to a later version of the Pencil or change versions when your equipment has been upgraded.

PROGRAM NAME: SMAL/80 CATEGORY: Programming language

DESCRIPTION: SMAL/80 is a compiled, structured microprocessor language for 8080 and 8085 microprocessors. Included is a macro processor that permits conditional expansion of statements and unlimited nesting of macros.

MINIMUM HARDWARE REQUIRED: 16K bytes of memory plus disk system plus usual input/output peripherals.

SOFTWARE REQUIRED: CP/M or Isis I operating systems.

RESTRICTIONS: Current version is non-relocatable.

DOCUMENTATION: SMAL/80 User's Guide

MEDIA: CP/M or Isis I disks

DATE CURRENT VERSION WAS RELEASED: June, 1978

WARRANTY: Free exchange for defective disks. Registered owners get

PRICE: \$75.00. Mastercharge/Visa accepted. updates.

ORDER FROM: CHROMOD Associates
PO Box 3169
Grand Central Station
New York, NY 10017

REMARKS: Relocatable 8080 and Z-80 versions in tape cassette formats will become available sometime early in 1979. We will undoubtedly have SOLOS/CUTER and PTDOS versions available by the spring of 1979.

PROGRAM NAME: BIG PRINT CATEGORY: SIGN MAKER

DESCRIPTION: The copyrighted program BIG PRINT is used to print giant block characters to create any message on 14 7/8 inch paper. Each character is printed sideways on the paper so words cover several sheets of paper. The characters available are the letters A-Z upper and lower case, the numbers 0-9, and the special characters \$ - . , ; " ' ? !
Only the object code is released.

MINIMUM HARDWARE REQUIRED: 16K RAM plus SOLOS/CUTER and system RAM; 132 print position printer. HELIOS version requires additional 12K.

SOFTWARE REQUIRED: Version SS requires SOLOS/CUTER.

Version SS-H additionally requires HELIOS (PTDOS).

RESTRICTIONS: Only conversant in English.

DOCUMENTATION: All the documentation and instructions are via the VIDEO DISPLAY.

MEDIA: SOLOS/CUTER version on cassette; PTDOS version on cassette.

DATE CURRENT VERSION WAS RELEASED: September 1978.

WARRANTY: 90 Day repair/replace.

PRICE: \$29.95 plus 6% sales tax. We welcome VISA and MASTER CHARGE.

ORDER FROM: COMPUTER DEMO ROOM, INC.
509-B Francisco Blvd
San Rafael, CA 94901

Phone (415) 457-9311

REMARKS:

PROGRAM NAME: THE BILLER CATEGORY: Business

DESCRIPTION: The Biller is a complete billing and accounts receivable package. Programs included perform the following:
1. Print invoices, bills of lading and shipping labels
2. Update accounts receivable files 3. Age accounts receivable and print aged trial balance
4. Convert from manual system to The Biller
5. Process account inquiries
6. Create master diskettes

MINIMUM HARDWARE REQUIRED: 32K RAM, including all system RAM; 2 North Star disk drives; SOLOS/Cuter; printer.

SOFTWARE REQUIRED: North Star Basic 10 Digit precision, if desired.

RESTRICTIONS: None

DOCUMENTATION: Complete, easy to follow users manual. Also includes programmers guide.

MEDIA: North Star diskette

DATE CURRENT VERSION WAS RELEASED: 7/15/78

WARRANTY: 90 days repair; one year update

PRICE: \$525.00 pre-paid

ORDER FROM: Fraser Associates, Ltd., P.O. Box 123, Holly, Michigan 48442 (sole distributor)

REMARKS: This system has been developed for, and field tested in a commercial user environment.

PROGRAM NAME: THE BUILDER CATEGORY: Builders and Contractors

DESCRIPTION: The Builder is complete job bid, billing, and job costing system. Programs included perform the following:
1. Print formal bid with all line items for construction job.
2. Update completion status and print periodic invoices.
3. Update account receivable.
4. Update sub-contractors invoices and payments and print job cost report.
5. Print summary job cost reports.

MINIMUM HARDWARE REQUIRED: 32 K RAM, including all system RAM; 2 North Star disk drives; SOLOS/Cuter; printer.

SOFTWARE REQUIRED: North Star Basic 10 Digit precision, if desired.

RESTRICTIONS: None

DOCUMENTATION: Complete, easy to follow users manual. Also includes programmers guide.

MEDIA: North Star diskette

DATE CURRENT VERSION WAS RELEASED: 7/20/78

WARRANTY: 90 days repair; one year update

PRICE: \$475.00

ORDER FROM: Fraser Associates, Ltd., P.O. Box 123, Holly, Michigan 48442 (sole distributor)

REMARKS: This system has been developed for, and field tested, in a commercial user environment.

PROGRAM NAME: SAM76 Graphics CATEGORY: Plotter

DESCRIPTION: Graphics extension to the SAM76 language interpreter with a set of the vector lists for some twenty character fonts developed by A. V. Hershey of the U.S. Navy Weapons Development Lab., Dahlgren, VA.

MINIMUM HARDWARE REQUIRED: Plotting device - can be CALCOMP or equivalent incremental plotter, or display with graphics capability. With a modicum of cleverness any character oriented display device can be used.

SOFTWARE REQUIRED: SAM76 language with CPM disk interface.

RESTRICTION: Authorship credit for the font designs should be given to Dr. A. V. Hershey on any material to be distributed more than casually.

DOCUMENTATION: SAM76 Language manual. Source listing of SAM76 plotter program.

MEDIA: CPM diskettes

DATE CURRENT VERSION WAS RELEASED: March 1978

WARRANTY: Good looking graphics.

PRICE: \$15.00 for diskette.

ORDER FROM: SAM76 Inc., PO Box 257, RR1, Pennington, NJ, 08534, USA.

REMARKS: None.

PROGRAM NAME: ML01 CATEGORY: General Purpose

DESCRIPTION: Prints mailing labels from a name and address file.
The file has 4 lines of 35 characters each. The labels can be sorted by zip code

MINIMUM HARDWARE REQUIRED: Printer with tractor feed, CRT, 32K, 2 disk drives.

SOFTWARE REQUIRED: CP/M, CBASIC, QSORT

RESTRICTIONS:

DOCUMENTATION: Complete, easily understood user's manual.

MEDIA: Single or Double Density Diskette

DATE CURRENT VERSION WAS RELEASED: 6-78

WARRANTY: 6 months

PRICE: Write for price information.

ORDER FROM: H & H Associates, Inc.
P.O. Box 19504
Denver, Colorado 80219
(303) 355-1067

REMARKS:

PROGRAM NAME: SAM76 Adventure CATEGORY: Game

DESCRIPTION: The text data base and the interrelationship tables for the game of Adventure originated by Willie Crowther. Data base is upper/lower case. Preliminary SAM76 language control script is also provided as a guide and learning tool to implementing the game fully using this language.

MINIMUM HARDWARE REQUIRED: 32K CPM system.

SOFTWARE REQUIRED: SAM76 language interpreter with CPM interface.

RESTRICTION: Credit to original authors.

DOCUMENTATION: SAM76 Language manual.

MEDIA: CPM Diskettes.

DATE CURRENT VERSION RELEASED: October 1978.

WARRANTY: You will probably get lost.

PRICE: \$15.00 for diskette.

ORDER FROM: SAM76 Inc., PO Box 257, RR1, Pennington, NJ, 08534, USA.

REMARKS: This is NOT a truly functional game - so do not expect to just run it

PROGRAM NAME: CI01 CATEGORY: General Purpose

DESCRIPTION: Categorizes clients and files, immediate retrieval of any information indexed, cross indexes any information entered, name and address retention, prints reports of customers or clients by 1) Reference code, 2) Record id, 3) Zip code, 4) Category and/or code. Prints address labels for mailing lists.

MINIMUM HARDWARE REQUIRED: Printer, 32K, CRT, 2 disk drives

SOFTWARE REQUIRED: CP/M, CBASIC, QSORT

RESTRICTIONS:

DOCUMENTATION: Complete, easily understood user's manual.

MEDIA: Single or Double Density Diskette

DATE CURRENT VERSION WAS RELEASED: 5-78

WARRANTY: 6 months

PRICE: Write for price information.

ORDER FROM: H & H Associates, Inc.
P.O. Box 19504
Denver, Colorado 80219
(303) 355-1067

REMARKS:

PROGRAM NAME: AR01 - Accounts Receivable CATEGORY: Business

DESCRIPTION: Handles both Balance Forward and Open End accounts, Automatic and/or manual service charging, Full Audit controls and reporting, Generates Cash Receipts Journal, Trial Balance, Ageing Report, Service Charge Report, and Daily Transaction Journal. Retains High, Low balance, Date last payment, Date last activity, Statement cycle, Credit status, Salesman code, 30,60,90 day balances and numerous other information.

MINIMUM HARDWARE REQUIRED: Printer, 32K, CRT, 2 disk drives

SOFTWARE REQUIRED: CP/M, CBASIC, QSORT

RESTRICTIONS:

DOCUMENTATION: Complete and easily understood user's manual.

MEDIA: Single or Double Density Diskettes

DATE CURRENT VERSION WAS RELEASED: 7-78

WARRANTY: 6 months

PRICE: Write for price information

ORDER FROM: H & H Associates, Inc.

P.O. Box 19504

Denver, Colorado 80219

(303) 355-1067

REMARKS:

PROGRAM NAME: OE01- Order Entry CATEGORY: Business

DESCRIPTION: Customer and Manufacturer history and sales information Commission figures, Automatically prints inquiry letters, Immediate retrieval of information for customer inquiries, CRT displays of customer orders, Prints order reports showing priority orders

MINIMUM HARDWARE REQUIRED: Printer, 32K, CRT, 2 disk drives

SOFTWARE REQUIRED: CP/M, CBASIC, and QSORT

RESTRICTIONS:

DOCUMENTATION: Complete and easily understood user's manual.

MEDIA: Single or Double Density Diskette

DATE CURRENT VERSION WAS RELEASED: 7-30-78

WARRANTY: 6 months

PRICE: Write for price information

ORDER FROM: H & H Associates, Inc.

P.O. Box 19504

Denver, Colo. 80219

(303) 355-1067

REMARKS:

PROGRAM NAME: IC01 CATEGORY: Business

DESCRIPTION: Inventory Control offers automatic ordering, full audit trails, optional vendor and/or manufacturer information, number on hand, number on back order, number on order, order point, order quantity, sold MTD, sold YTD, last sale, last order, 5 prices, 3 costs, and unit of measure.

MINIMUM HARDWARE REQUIRED: Printer, 32K, CRT, 2 disk drives.

SOFTWARE REQUIRED: CP/M, CBASIC, QSORT

RESTRICTIONS:

DOCUMENTATION: Complete, easily understood user's manual.

MEDIA: Single or Double density Diskette

DATE CURRENT VERSION WAS RELEASED: 7-78

WARRANTY: 6 months

PRICE: Write for price information.

ORDER FROM: H & H Associates, Inc.

P.O. Box 19504

Denver, Colorado 80219

(303) 355-1067

REMARKS:

PROGRAM NAME: LB01 - Law Billing CATEGORY: LAW

DESCRIPTION: Profitability analysis by attorney or case type, Full audit trails, Multiple matters per client, Numerous fields per matter, Historical information retained (Year to date and Case to date), Pre-statement verification, Statements, User defined transaction codes.

MINIMUM HARDWARE REQUIRED: Printer, 32K, CRT, 2 disk drives

SOFTWARE REQUIRED: CP/M, CBASIC, QSORT

RESTRICTIONS:

DOCUMENTATION: Complete and easily understood user's manual.

MEDIA: Single or Double Density Diskette

DATE CURRENT VERSION WAS RELEASED: 10-12-78

WARRANTY: 6 months

PRICE: Write for price information

ORDER FROM: H & H Associates, Inc.

P.O. Box 19504

Denver, Colorado 80219

(303) 355-1067

REMARKS:

PROGRAM NAME: SAM76 CATEGORY: Interpreter

DESCRIPTION: General purpose interpreter particularly effective for character string manipulation. Powerful resident functions for pattern matching and sorting. Infinite precision arithmetic and logic functions, recursive and nestable to any depth - limitation being only size of memory. Approximately 150 resident functions.

Disk version interfaces with CPM and contains some thirty additional functions, including means for block checksummed communications between any data source and any data destination.

MINIMUM HARDWARE REQUIRED: RAM or ROM 8K for 280 9K for 8080, plus 3K for disk and extra functions; keyboard, output device - upper and lower case full USASCII character set desirable.

SOFTWARE REQUIRED: Input and Output drivers plus CPM if disk system used.

RESTRICTIONS: None to my knowledge; with a modest amount of ingenuity any task is accomplishable.

DOCUMENTATION: SAM76 Language Manual, Dr. Dobb's, Creative Computing. Source for CPM interface with SAM is available. Main program source available only to individuals who are able to prove extensive knowledge and understanding of the language and its philosophy and who wish to implement on another machine.

MEDIA: CPM standard and North Star, Paper Tape, POLYmorphic Cassette, and TDL/KITAN SMB.

DATE CURRENT VERSION WAS RELEASED: October 1978

WARRANTY: None except for pleasure and satisfaction unless the user is skilled or likes BASIC and the like.

PRICE: SAM76 manual - \$12.00; CPM diskettes - \$15.00 Tape or cassettes \$10 (with additional info).

ORDER FROM: SAM76 Inc., Box 257 - RR1, Pennington N. J., 08534, USA. Phone (609)-466-1129/1130 for info. Letters not answered with dispatch.

REMARKS: It is not advisable to get the book unless you have an operational SAM76 system. Users are encouraged to distribute copies of the object code.

PROGRAM NAME: SOLCPM CATEGORY: OP SYSTEM

DESCRIPTION: CP/M COMPATIBLE INTERFACE SOFTWARE AND FIRMWARE FOR SOL20 / ICOM DISK MODEL FD3712

MINIMUM HARDWARE REQUIRED: 16K EXCLUSIVE OF OP SYSTEM

SOFTWARE REQUIRED: CP/M, CBASIC

RESTRICTIONS:

DOCUMENTATION: OPERATING INSTRUCTIONS AND SOURCE LISTING ARE INCLUDED WITH 2708 PROM

MEDIA: PRE-PROGRAMMED PROM

DATE CURRENT VERSION WAS RELEASED: JULY 4, 1978

WARRANTY: 90 Day

PRICE: \$ 150.00 + \$ 2.00 Shipping

ORDER FROM:

Computer Mart Ltd.,
1543 Bayview Avenue, Toronto, Ontario CANADA M4G 3B5

REMARKS: CP/M, CBASIC MUST BE PURCHASED SEPARATELY FROM DIGITAL RESEARCH CORP., OR COMPUTER MART LTD. DELIVERY 2 WEEKS

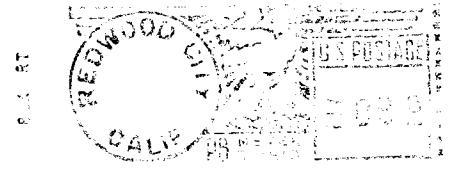
ALL 1978 SUBSCRIPTIONS

EXPIRE WITH THIS ISSUE!

TIME TO RENEW

SEE RENEWAL INFO INSIDE

PROTEUS/SOLUS NEWS
S.M. SOKOLOW, Editor
1690 Woodside Rd., #219
Redwood City, CA 94061



James D. McElroy
2826 Crest Ave. N.
Allentown, PA 18104

SOLUS NEWS

A newsletter for owners of Processor Technology computers

BONUS
ISSUE

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TIME TO
RENEW ALL
SUBSCRIPTIONS

LOOKING BACK AND AHEAD FOR SOLUS NEWS

This is the end of our first full year of operating Solus News, and a time of transition. We've seen the newsletter grow from a two page flyer into this hefty size, and expect next year to maintain the size and improve the quality and regularity of the issues. Six per year seems to be the optimal number; not too frequent to burn out the staff, but not too seldom for the readership.

In the coming year, I want to introduce more material for the end-user who uses the Sol with pre-programmed packages. To such a person the details of patching so-and-so's BASIC to run on a Sol with whose-it's disk just isn't useful information. As PTC moves from the hobby market to the small business market, more and more Solus News readers will be unfamiliar with programming and they will need this type of support. This isn't to say that less content will be of interest to the hobbyist. Moreover, it is probably the hobbyist who has the expertise to solve the problems of the end-user, so I hope some of our avid contributors will try to produce more articles of a tutorial nature. By this I mean, articles that help us to read between the lines of users' manuals, explain how to do things that are not obvious, compare competitive application programs (e.g., word processors), etc. We've had a number of these in the past, and look forward to more in the future.

In the next issue, we'll have a review of a book of BASIC programs, a description of the new PTC word processing program called the "WordWizard", the first in a series of tutorials for "Understanding PTDOS", a review of the new release of PTDOS (1.5) and its classy manual, a progress report on the PROTEUS library project for passing software among the various disk users libraries, plus our usual assortment of letters from readers and miscellaneous contributed items (including listings of a 16-bit arithmetic utility and a memory test program as custom commands for SOLOS/CUTER).

Best wishes for the coming year,

Stan

Stan Sokolow, your editor.

SOFTWARE --- WHERE IS IT?

In the Oct/Nov issue I published the Software Directory as it now stands, sadly meager. I know there is much more software available on Sol/Cuts cassettes and floppy diskettes than I have listed. As I mention elsewhere in this issue, I've tried to contact software vendors directly by mail, but have had little cooperation. Now, I am turning to the users. I want to know what software you have purchased on Sol/Cuts cassette or ANY diskette. Tell me where you got it and what it does. Also, let me know about software you got in printed listings from a software book. Many readers want to find programs, but don't know where to look.

If you have written a program which you think is useful to someone else, but you don't want to be bothered with the advertizing, distribution, and support of the program, let me know about it. I am toying with the idea of becoming a central mail-order point for all sorts of software for Sol systems, not to make money at it, but as a service to the user. (That's what PROTEUS is all about.) It doesn't have to be an earth-shaking opus, just something that works and is desirable to someone else. I've had inquiries for leads to software for business applications, for doctors, for churches, for retail sales, for research, for education, and other fields.

WORDWIZARD -- PTC'S ELECTRONIC TYPING DEMON

Processor Technology has released its word processor system based upon the Sol + Helios. According to a PTC spokesperson, even users of expensive word processing systems such as the Vycoc, Word-Stream, and Lexitron, have been impressed by the capabilities of the WordWizard compared to these other systems. PTC has been participating in exhibitions of the systems to attorneys. In the next issue we will have a detailed article on the features of the system, and hopefully in future issues, a comparison with competitive systems, such as the Electric Pencil.

P A S C A L F O R T H E S O L

If you have read Byte magazine recently, or have taken computer science courses as an undergraduate, you have likely heard about the programming language PASCAL. It has become the rage among computer science educators because it is a language designed to facilitate (and even coerce) the use of "structured programming". Until recently it was only available on the large computers that universities usually have. However, the University of California at San Diego has produced an implementation of standard PASCAL (extended in certain ways) for microcomputers. It is available from a few microcomputer manufacturers for their machines and from some computer clubs for CP/M disk systems. (It has been rumored that PTC has the UCSD PASCAL on Helios.) In addition, the Stanford Linear Accelerator Center's Computer Group has produced a microcomputer implementation of Standard PASCAL based upon the one done for the IBM 360/370. This system is not tied to its own operating system, so it can be adapted to run under many different operating systems.

The first diskette of the PROTEUS library for Helios has a preliminary version of S.L.A.C. PASCAL on it. This version is capable of compiling the PASCAL compiler, which itself is a PASCAL program, so it is quite powerful.

PROTEUS is working on adapting the S.L.A.C. PASCAL system to the Sol as a cassette system. It will probably require a minimum of 32K bytes of RAM (not including the RAM used by Solos/Cuter) and would be able to compile a program the size of the compiler in 48K. Two cassette recorders would be needed. Loading the compiler will probably require about 4 minutes. The speed of compilation will be limited by the cassette I/O speed. Two phases are required: compilation of the source to intermediate code and then assembly and compaction of the intermediate code. It certainly won't be as fast compiling, but it will be as powerful as PASCAL on a full-sized computer. Execution speed of the compiled programs has been estimated at 18 times faster than one of the fastest integer BASIC's around (Palo Alto Tiny Basic).

The Sol PASCAL will become available sometime in 1979. We will also have available popular texts and reference manuals on PASCAL so you can teach yourself. Later, the system may be adapted to mini-diskette operating systems, such as Northstar and Micropolis.

If you are interested in obtaining Sol PASCAL, let me know at the newsletter office so I can plan how many copies to produce on the first run. The letter of intent will not be a commitment on your part, just an expression of interest.

Dear Stan;

Finally had a chance to sit down and play some Monopoly (no pun intended), and I found a couple of bugs. Please make the following changes to the libraries program, and publish this errata.

```
1160 IF M(T9) < 0 THEN GOSUB 5350 ELSE 1170
1165 GOTO 1160
```

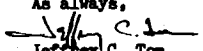
This takes care of making sure you have enough money to get out of jail properly.

```
4585 LET D9=D9
```

This subtracts your building assessment, instead of adding it.

If I find any more of these quirks, I'll be sure to pass them on.

As always,


Jeffrey C. Tom
USS Gridley (CG-21)
c/o FPO SAN Francisco, CA
96601

SOL Users Society
P.O. Box 23471
San Jose CA 95153,
U. S. A.

C. S. Hopman,
B. P. 225,
Noumea,
New Caledonia,
(South Pacific)

9th October, 1978.

Re: Membership.

Dear Sirs,

We are a small group of people who have decided to form a micro-computer club on this rather remote tropical island. In all probability we will acquire a SOLIV during the next few months. Michael Phillips International Trading Group provided us with your address because we are interested in knowing what sort of software will be available to us (aside from what we can find in Creative Computing and Byte).

Enclosed you will find the \$15.- membership fee for 1 year + \$5.- which might be used for sending us a copy of any software catalogue you might have available now. We are interested in small business applications. Is there a (workfile type) sort program available? File to file operations, particularly file to print with minimal report generation? Inventory, customer billing, general ledger?

We will have a SOL IV, Diablo 1345A printer, Satchel Carlson Video Monitor 12", GPM and ALS-8 ROM modules. Audio cassettes will be obtained locally. Do you have any suggestions as to the type of peripherals we should obtain so as to be sure that the future information exchange between you and us will be as trouble free as possible (Digital cassettes, paper tape...) Any other comments on the suitability of our configuration?

We hope to be able to contribute small business and technical type programs to your library in the future.

Yours sincerely,



(Ed. Note:

PROTEUS's new service is the HELIOS library. With a Sol IV, you will be able to exchange information via Helios diskettes, so you'll fit right in. In fact, you represent the primary target type for the library. Our first diskette has no business application programs yet, but it does have a basic statistics program, a game, a major software system (a PASCAL compiler), and a few odds and ends. I am working on obtaining and converting programs from other software libraries, such as the Northstar disk library and the CP/M library.

I know there are commercially available business packages for Sol, but I have no details yet. When I do, they will be in the newsletter.

Please keep us informed of your activities. I like to have news from local Sol users groups all over..)

ACCESS RESURRECTED

We've heard from an impeccable source at PTC, that a new editor has been assigned to bring PTC's user-oriented publication, ACCESS, back to life. The new ACCESS will appear in January, 1979, and the first three issues will be sent to all previous subscribers as part of their original subscription. Like Solus News, the new ACCESS plans to have a balance of items for the technical and non-technical readers. The new editor is reportedly looking for contributed articles, and especially applications software.

The question has come up in the past, how should Solus News and ACCESS co-exist? What is the role of each? To reiterate, ACCESS is published by Processor Technology Corporation; Solus News is published by PROTEUS, an independent users service organization for Processor Technology equipment users. Although we have a cooperative relationship, neither exerts any direct control over the other. It is my feeling that both have a role. ACCESS is the voice of PTC to its customers; Solus News is the voice of the customers to each other, to PTC, and to other vendors. PTC needs to keep the customer satisfied, and we need to help PTC in our own way to remain a viable company so we can get the customer service we need. PTC has had its growing pains but as far as I can see, it has always strived to provide a high standard of quality and service.

In the coming year, the interaction of the users group and PTC will become clearer. Readers' comments are invited. As for now, let's try to help ACCESS get off to a good start again. I'll be submitting articles for publication there, and hope you will send them a few letters, as well as to Solus News. I'm sure they would appreciate material directly related to their product line, whereas Solus News is happy to publish material on other vendors products (accessories, peripherals, etc.) as they relate to PTC products, as well as items on PTC products.

ISSUES LATE --- BONUS ISSUE

The October/November issue was the first issue to be laid-out by the graphics department at PTC. Unfortunately, when the copy was ready for layout, PTC was involved in getting a number of manuals ready for printing, including the new PTDOS 1.5 manual and the WordWizard electronic typing system manual. Then when that was done, a key person in the graphics department became ill. Consequently, the issue was later than usual. This December issue was prepared by PROTEUS as a bonus to compensate for the lateness. If circumstances such as these continue to interfere with getting Solus News out to you at reasonable intervals, PROTEUS will make other arrangements as we have said before.

Dear Reader,

How about some help? I just bought a TC-71 Selectric terminal from NCE/Compumart (Ann Arbor, MI). I need an interface between Sol's Ascii and the terminal's EBCDIC. They sell a board for \$200 which performs the conversion, buffers data, and idolates the typewriter to be used locally. Has anyone homebrewed anything like this? Do you know of any published articles?

Thanks,

Tom Tollefsen
4470 Lakeside Dr.
Glen Ellen, Ca 95442
(707) 996-5753

Sept. 26, 1978

Dear Stan,

Please note my change of address for contacting the Regina chapter. You no longer have to be crazy to join, just live in a crazy world. Last month I was a clinical psychologist; this month, manager of manpower and training of a major metropolitan computer utility. And I owe it all to my Sol.

Keep up the good work on the newsletter. I know it's probably a full-time jog in itself, but it is needed. I don't know what I could do to help, but if there is, let me know.

Best regards,

Bob Stek
Saskatchewan Computer Utility Corporation
2161 Scarth Street,
Regina, Sask. S4P 2H8
CANADA

SOL USERS' SOCIETY
P.O. Box 23471
San Jose, CA. 95153

11/10/78

RE: SOLUS CHAPTER

Dear Covina Area SOL Users:

We are pleased to inform you that another SOLUS Chapter has been formed for your benefit.

We are an independent research facility and feel it is time to share the wealth.

Meetings are the 1st Monday of every month at 7:30 P.M., in addition there is a 24 hour hot-line open for all Sol Users' who are having problems and need help or other advice.

We hope we can be of service to all Sol Users' and would like to hear from everyone who would like to join.

In view of the area we are located in we feel there are a lot of Sol Users' out there with no where to go ; so here's your chance. We are not limited to Sol computer owners, our lab has tested almost every major brand and can assist almost all small systems owners. We have a program Listing, free to members, tech.manuals for loan to members, and do lend all publications to our members. I.E. books commonly found in computer stores and some uncommonly found.

All services are free of charge except for postage, well we can't do everything. There are no hitches and no membership fee just a genuine interest, "it's tax deductible".

Just one personal note: Hate to see Solus Turned over to P.T. for publication, "familiarity breeds contempt", so hope you keep the old eyeballs sharpened .

Thanks for a great publication. Please publish address and phone.

Sincerely

Bruce G. Diller
Dr. Bruce G. Diller, Ph.D.
Director of Research
Chapter Chairperson

3
Lexington Labs
SOLUS CHAPTER
18651 E. Gallarno Drive
Covina, CA. 91722
Hot-Line 213-332-9880/ 24 hours

CASSETTE LIBRARY

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DEAR STAN:

PLEASE INFORM YOUR READERS THAT THE FIRST TWO TAPES OF THE SOLUS LIBRARY HAVE FINALLY BEEN COMPLETED.

IN ADDITION TO LISTING THESE TAPES, I HAVE COMPILED A LIST THE COMBINATION OF WHICH REPRESENTS THE ENTIRE CONTENTS OF THE LIBRARY. THIS WILL PERMIT YOUR READERS TO EASILY DETERMINE WHAT PROGRAMS THE LIBRARY STILL NEEDS. I REGRET THAT I MUST ALSO REQUEST THAT THOSE OF YOUR READERS WHO HAVE SUBMITTED PROGRAMS ALSO REVIEW THE LISTS TO VERIFY THAT THEIR PROGRAMS ARE INCLUDED. RATHER THAN WORE YOU WITH THE CIRCUMSTANCES WHICH MAKE THIS NECESSARY, JUST LET ME SAY THAT WHEN I TOOK OVER AS THE CLUB'S THIRD LIBRARIAN, IT WAS NECESSARY TO RECONSTRUCT THE LIBRARY ALMOST FROM SCRATCH.

ADDITIONALLY, WHEN I ASSUMED THIS POST I UNDERTOOK TO CONTACT THE VARIOUS PUBLICATIONS TO GET A BLANKET COPYRIGHT RELEASE SO THAT WE COULD MASS DUPLICATE PROGRAMS IN THE LIBRARY AND DISTRIBUTE THEM TO THE MEMBERS AT COST. UNFORTUNATELY, THE RESULTS WERE QUITE DISAPPOINTING, BUT I FEEL THAT THE MEMBERS WILL FIND THE RESULTS INTERESTING. DIGITAL INDICATED THAT WE COULD ONLY COPY A SMALL NUMBER OF THEIR PROGRAMS, AND THEN ONLY IF WE GOT INDIVIDUAL RELEASES FROM THE VARIOUS AUTHORS. CREATIVE COMPUTING WOULD ALLOW US TO COPY THEIR PROGRAMS ONLY IF WE PAID THEM A SUBSTANTIAL ONE TIME CHARGE PLUS A SIMILAR PER COPY CHARGE FOR EACH PROGRAM.

BYTE, INTERFACE AGE AND PERSONAL COMPUTING WOULD NOT GRANT BLANKET RELEASES, BUT RATHER REQUIRED SPECIFIC AUTHORIZATION FOR EACH PROGRAM. UPON SUGGESTING A SPECIFIC PROGRAM, I WAS GRANTED PERMISSION BY BYTE AND TURNED DOWN BY INTERFACE AGE. I DID NOT HAVE A SPECIFIC PROGRAM TO SUGGEST TO PERSONAL COMPUTING, HOWEVER, I BELIEVE THAT THERE WOULD NOT HAVE BEEN A PROBLEM.

ON THE TELEPHONE, PCC SAID THAT WE ARE FREE TO USE THEIR PROGRAMS. BEING A SKEPTIC, I FOLLOWED UP THE CALL WITH A LETTER. ALTHOUGH THEY WERE SLOW IN RESPONDING, THEY WERE JUST AS POSITIVE. (THUS, I WOULD APPRECIATE IT IF THOSE WHO SUBMIT PROGRAMS WHICH ARE TRACABLE TO PCC WOULD IDENTIFY PCC AS THE SOURCE IN A REMARK OR PRINT STATEMENT EARLY IN THE PROGRAM.)

THE SLOWEST RESPONSE WAS FROM KILOBAUD. SINCE THEIR PROPOSAL MIGHT BE OF INTEREST TO THE CLUB, I AM FORWARDING THEIR LETTER TO YOU FOR PUBLICATION. PERSONALLY, I DOUBT THAT ANY ROYALTY A MEMBER MIGHT RECEIVE WOULD EVER BE WORTH HIS/HER WORK OR THAT ANY CLUB DISCOUNT WOULD COVER THE COST TO US OF POSTAGE AND HANDLING, BUT THEN AS INDICATED, I AM A SKEPTIC. (SHOULD THERE BE ANY CLUB INTEREST, I THINK THAT IT IS IMPORTANT THAT THE CLUB REACH A SATISFACTORY AGREEMENT WITH KILOBAUD BEFORE ANY WORK IS UNDERTAKEN.)

FOR THIS AND OTHER REASONS, INCLUDING POSSIBLE PITFALLS IN MAKING MULTIPLE COPIES, I HAVE SUGGESTED THAT THE LIBRARY BE RUN AS A LENDING ONLY LIBRARY, BY THE TIME THAT THIS IS PUBLISHED, THE VARIOUS CHAPTERS SHOULD HAVE BEEN CONTACTED TO ARRANGE FOR

THE 2 TAPES TO BE LENT OUT. THIS PROCEDURE SHOULD ENCOURAGE THE GROWTH OF THE VARIOUS CHAPTERS AND ENCOURAGE MEMBERS TO MEET TO SWAP THEIR INDIVIDUAL PROGRAMS.

ONE THING WHICH HAS BECOME QUITE EVIDENT IS THAT MOST OF THE PROGRAMS AND LABOR HAVE BEEN DONATED BY BUT A HANDFUL OF PEOPLE. I AM AFRAID THAT UNLESS THIS CHANGES, WHEN THESE FEW WORKERS TIRE, THE LIBRARY WILL FLOUNDER. SEVERAL PEOPLE WHO FEEL THAT THIS IS INEVITABLE HAVE SUGGESTED THAT THE LIBRARY BE AVAILABLE ONLY TO CONTRIBUTORS AND THEN ON A PROFIT BASIS. I GUESS TIME WILL TELL.

I HAVE ENJOYED WORKING ON THE LIBRARY AND HOPE THAT IT IS OF BENEFIT TO AT LEAST A FEW OF THE MEMBERS.

Dick Loma

CATALOG OF TAPE 1 PROGRAMS FOR

P.T. 5K BASIC

SLOTS B 1AD9 128E
ESTAR B 1AD9 048E
BLKJK B 1AD9 178A
CRAPS B 1AD9 078D
ACCUD B 1AD9 07BF
MIND B 1AD9 1945
KING B 1AD9 1E18
SQUIZ B 1AD9 1108
STARS B 1AD9 0A15
TRAP B 1AD9 0587
TAXMN B 1AD9 0DCC
REVRB B 1AD9 0880
HURKL B 1AD9 0A33
TTTTT B 1AD9 0EAE

PALC ALTC TINY

BASIC AND GAMES

THEREFOR
BLKJK C 0000 2000
BTREK C 0000 2000

PROGRAMS FOR

P.T. EXTENDED

BASIC
STORY C 3C20 0B11
SILLY C 3C20 0BF2
WMPUS C 3C20 0E74
LIM C 3C20 0D54
BAGEL C 3C20 082B
GUESS C 3C20 01FA
MGWMP C 3C20 09EA
MATCH C 3C20 1006
TACTC C 3C20 08A6
DCCDE C 3C20 017B
XAGCN C 3C20 0A23
AWARI C 3C20 05F8
BJACK C 3C20 13FB
CAVES C 3C20 1809
MIND C 3C20 05CA
CTHEL C 3C20 10CB
YANTZ C 3C20 1445
END 0000 0001

CATALOG OF TAPE 2 TUNES FOR SOFTWARE

TECH. MUSIC PRG.

CNTRY 0803 048E
CKES 0803 0436
SCARB 0803 0804
AQUAR 0803 093A
CRNGB 0803 0486
STLIF 0803 05F8
SONGS 0803 0677
THING 0803 037A
GREEN 0803 0439
SILVR 0803 03DD
NCSUN 0803 038D
YANKE 0803 04FB
BACH 0803 1325
WEEKD 0803 087A
MICHL 0803 050D
HERE 0803 0444
RINGO 0803 04E9
PROEL 0803 055F
2PI12 0803 07AD
GIGUE 0803 099C
CCTYR 0803 0976
SCMAT 0803 0E43
RAIN 0803 0964
LIGHT 0803 038A
HEART 0803 0484
LSTRY 0803 0377
CLCSE 0803 0490
TANGC 0803 08A9
GRENE 0803 0439
LAURA 0803 06BC
PURPL 0803 06F2
YAKY 0803 0857
WORLD 0803 03F0
MCZRT C 0803 0C43
WACHT C 0803 11DF
GDANI C 0803 0583
GDANS-0-0800-0588
GDANS C 0803 04F7
MAREF C 0803 0557
END C 0000 0001

OTHER BASIC PRG.

PLOTS C 3C20 0804
XYPTC C 3C20 0117
MCHS C 3C20 0357
LUNAR C 3C20 0975
HRMBI C 3C20 0090
BLIND C 3C20 0149
HXDEC C 3C20 01FB
MATH C 3C20 06CA
FINAN C 3C20 15E4
VDFB C 3C20 180F
PNUTS C 3C20 0F5C
SLOTS C 3C20 043C
SCRTS C 3C20 0B15
ALFA C 3C20 0484
DAYS C 3C20 03A3
SMSRT C 3C20 081E
SLOTS C 3C20 09EE
FILES C 3C20 018C
KENC C 3C20 1404
KING C 3C20 1020
BIC C 3C20 072A
MCNCP C 3C20 3586

BLKJK

OBJECT AND ASSM PROGRAMS

YLINE C 0000 02C1
DALA C 0000 0341
BARGN C 0000 0101
DCTBR C 0000 0101
WSPN C 0000 0401
WKAL C 0000 0401
RWALK C 0000 0101
3XSAS C 0000 0801
HISTC C 0120 05E1
WALK C 0200 0201
DISAS 2000 0800
ASSM C F000 1000
TASSM C F000 1000
ASSM S 0100 237B
TASSM S 0100 096D
DASC1 S 0100 05D2
ECDC S 0100 0834
MCVE S 0100 0279
PRCMP S 0100 0640
CUP0 F 0001 055A
CUP1 F 0001 1C97
CUP2 F 0001 1988
CUP3 F 0000 00FC
SCDC1 F 0001 1382
SCDC2 F 0001 03CF

M300+

SRC4

ASSM

LIST

Solus
P.O. Box 23471
San Jose, CA 95153
Attn: Editor

October 20, 1978

Dear Sir:

Enclosed is my check to cover SOLUS membership. I have had some rather serious problems with my system; especially with P.T.C. software. I am seeking answers to a number of questions and you are my last resort. If you are unable to help me, please return my check.

I have an IMSAI machine with 32K RAM, CUTS, CUTER, an ADM-3A, and an AC-30. Generally I am very pleased with the system and with the P.T.C. components that are included. The software, when it works, is generally good. My contacts with P.T.C., when I have received responses has also been good. It is the area of lack of response and the lack of working software that causes the problems. Since P.T.C. is unable, unwilling or just too busy to help, I am turning to you.

- I. ACCESS: I picked up a copy of your publication and found that you were planning to have P.T.C. produce your news letter. Based on my experience with ACCESS, I would not recommend it. I subscribed to ACCESS, but have received issues generally only after asking about its status. I believe that the reliability of P.T.C. as a publisher is very questionable.
- II. VDM VS CRT: When I started building up my system, I decided to go the CRT route, for several reasons. Someday, I may add a VDM, but not now. P.T.C. supposedly supports the VDM and CRT user, but unfortunately does not do a very good job with the CRT. This has been brought to the attention of P.T.C. on several occasions, but the problems continue. If P.T.C. wishes to support VDM systems only, that is their right and they should so state and get it over with. Most of my difficulties seem to relate to the fact that I have a CRT.
- III. SOFTWARE #1: Until I am able to acquire a disk drive, this package appears to answer most of my needs. Unfortunately, it has some problems. It does not desire to respond to a CRT. I had one fix that allowed me to work the software, but I could not re-enter if I exited to the monitor. Can you supply me with the necessary patches that will allow the package to become fully operational.
- IV. EDIT: Again, a nice piece of software, but again requiring modification to work with a CRT. There is a fix for this also. The real problem here is that the two sub-routines used to pack or un-pack do not work. I am not sure what the Edit fix is anymore and the specific sub-routine that is not working has slipped past me. I have been waiting for a response from P.T.C. for a considerable amount of time, but some of the details have been forgotten!
- V. TAPE DRIVES: I am using two Superscopes with CUTS. Generally, I am well pleased with their operation. I do have difficulty transferring data from tape to tape (updating files etc.). I use the full capability of the system and therefore have the input, output, and motor control lines connected at all times. I am beginning to find that possibly this is a mistake. Indications are that only the input or output lines should be connected to a given drive at any one time. Can you confirm or give me some suggestions?
- VI. ASSM: I have seen this package, but have seen no literature. What is it and will it work with a CRT? If the package requires patches to work with a CRT, what are they?
- VII. MSA-BASIC patches: In a copy of your news letter, there was an item concerning some patches to MSA Basic to permit better P.T.C. compatibility. The copy I saw was difficult to read and might have had some errors. I believe the author was a Mark Moseley. Can you help?

I realize that I have dropped a bunch of questions, but I have numerous problems. I am looking for some responses that will work. If you desire to pass along to P.T.C., please do so, but a high enough level to get some results. Although Ralph Palsson seems to be a nice guy, his responses and/or follow-up leave something to be desired. I can appreciate that P.T.C. may be a hectic place to be, but customer relations must be maintained at some level, (manufacturer, distributor, etc.) if they are to survive.

I sincerely hope to hear from you in the near future.

Thanks

John E. Breden
John E. Breden
921 Waterview Cir.
Richardson, Tx 75080
Home (214) 231-4384
Office (214) 692-2255

(Ed. Note: We sent a brief reply to John. Reader's comments may help John and others with similar problems.

We'll have more on fixing MSA-BASIC in the next issue.)

cc: SOLUS NEWS
c/o: Stan Sokolow
1690 Woodside Road
#219
Redwood City, CA 94061

Dear Stan:

Attached is a letter which outlines my problem in using this new technology. It is specific and yet typical.

We would appreciate hearing from other businessmen trying to utilize a system such as ours.

We look forward to receiving SOLUS NEWS. Your efforts are appreciated.

Sincerely,

Charles I. Hansing
Charles I. Hansing

11-13-78

AJA Software
P.O. Box 2528
Orange, CA 92669

Gentlemen:

In September 1978, I purchased your GENERAL LEDGER program. As of now it has not been used because of time problems on our part and the following difficulties:

1. I am a one-man sales office and am not a computer specialist. Your instructions seem to be a random list of the product more than a step-by-step direction of what to do with the programs. Try giving the disc and instructions to someone, have them use it and then revise the instructions accordingly.
2. In order to understand what was happening I listed the programs. It would be helpful to have more REM statements in that I don't understand why you print 20 " " (clear screen?) in "CREATE" etc..

5

5

3. To use the program it is my understanding that a second diskette is to be used with certain files. It escapes me as to where in the instructions this is indicated. It would be helpful if you listed the names, length and type in the instructions (Since you did list a number of files, one of which was "BUFFER", I created it for insurance purposes). Maybe it is wishful thinking, but perhaps a program can be devised to create those files.

4. My system is a SOL 20 with a single North Star drive and a printer. The printer interfacing information supplied did not help me at all. Your inclusion of additional information such as either a special disc for SOL/N* users, a list of program lines to be changed or "PRINT #A" and "INPUT A" statements in your software would be helpful.

5. In creating my own list of accounts I found I made errors in entering them but could not correct them without re-entering the data. I also expect I will want to make changes in the future. A program or instruction that would permit revising the file would be helpful. A sample list should also be included, especially since "1100 CASH IN BANK" is part of the program.

My point in writing the above is twofold in that I'd like you and other software companies to give further consideration to the product and secondly to the growing number of neophytes such as myself that are trying to utilize this new technology. We need information on what your product is so we can determine if it meets our needs (and isn't too high-powered for us) BEFORE purchasing it, we need directions on how to adapt it to our particular system and we need those step-by-step instructions.

We are using Electric Pencil by Michael Shraye to compose this letter. We were able to use that product the first day we had it. We purchased it because of favorable "word of mouth", somewhat sufficient information on the product before purchase, excellent adaptation to our system and good documentation. Not knowing what the costs are to develop it I can't judge if the price-to-cost ratio is a value or not but it does the job! Please take heed.

To show you we have some faith in your products we are enclosing a check for your MAILING LABEL SYSTEM. Consider this strictly a "Bingo" purchase as the only information we have on it is the two line listing in your flyer and the fact that your similarly priced GENERAL LEDGER program has a lot of program lines.

We are sending a copy of this letter to SOLUS NEWS in the hope that other suppliers may also get some benefit from our tribulations and in an attempt to see if others are experiencing similar problems.

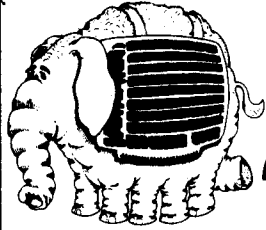
Sincerely,

Charles I. Hansing
4127 Beard Av. S.
Minneapolis, MN 55410

```

A PTDOS COMMAND TO GO TO SOLOS
COPY NPTDEFS
SRESET EQU OBCBOH
ORG CXBUF
SOLOS EQU $
LXI H, 'PT' ;COMMAND IS 'PT'
SHLD OC83CH ;STORE IN CUSTOM TABLE, 1st POSITION
LXI H, SRESET
SHLD OC83EH ;DOES SHORT RESET TO GET BACK TO PTDOS
JMP OC004H ;SOLOS RETRN ENTRY POINT
XEQ SOLOS
END

```



<PRODUCT ANNOUNCEMENT>

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- BUSS PIN OUT:** Plug in compatible with Altair (S-100) type buss
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- ADDRESS SELECTION:** Addressable in 4K increments within range of 0-65K
- BANK SELECT:** 1 to 8 banks; Jumper selectable. Software controlled via output port 40 hex. Can be addressed up to 1/2 megabyte.
- BATTERY BACKUP:** Compatible with DMA
- FULLY BUFFERED:** All address and data lines buffered with powerful state of the art buffers.
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- NEWLY TESTED FEATURE:** Also compatible with new INTEL 8085A that runs @ 5MHz.

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	KIT	FULLY ASSEMBLED * TESTED & BURNED IN
Board & 8K of Memory	150.00 \$135.00	\$165.00 175.00
Board & 16K of Memory	265.00	315.00
Board & 24K of Memory	400.00	475.00
Board & 32K of Memory	525.00	620.00
8K Add on Kits	135.00	

T. I. TMS4044 250nsec Chips: 1-24 25-49 50-74 75-99 100-499 500+
\$7.00 \$6.75 \$6.50 \$6.25 \$6.00 \$5.75

* One year warranty on Artec assembled boards.

MANUFACTURER OF PRINTED CIRCUIT BOARDS AND COMPUTER PRODUCTS

← Assemble this file into image file "SOLOS". To go from PTDOS to SOLOS, give the command *SOLOS. To get back give the command >PT. The Video screen usually "folds" when switching between the two, but this doesn't bother the programs.